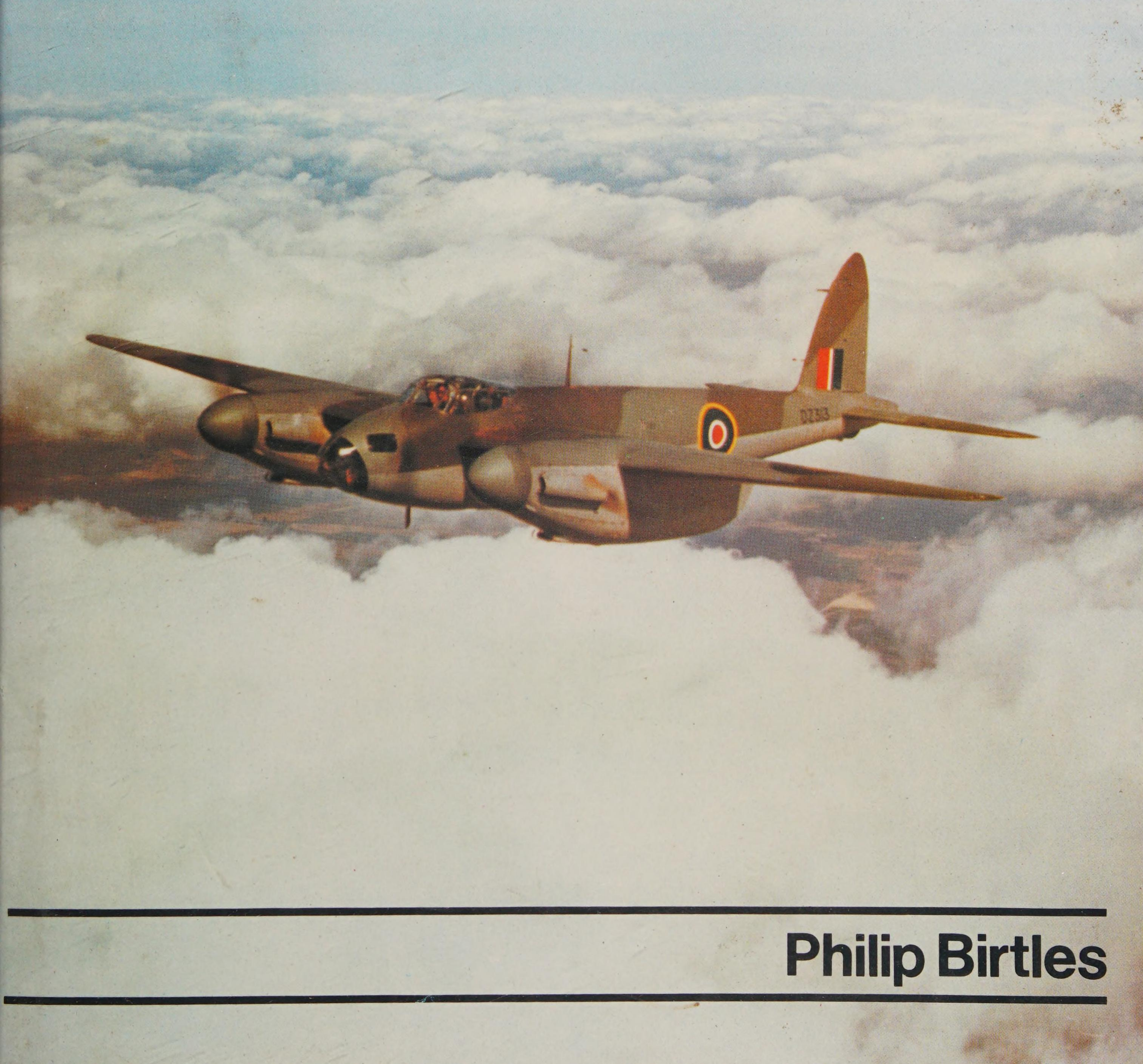
# mosquito

## A PICTORIAL HISTORY OF THE DH98



### Philip Birtles

PQ00162858

**$19.95**

"... I turn green and yellow with envy when I see the Mosquito. The British knock together a beautiful wooden aircraft that every piano factory over there is building . . . There is nothing the British do not have." – Reichsmarshall Hermann Göring.

Despite government apathy, work proceeded on this remarkable aircraft which started as "Freeman's Folly" and rose to be the "Wooden Wonder." Powered by two Rolls-Royce Merlin engines, it was the fastest twin-engined combat aircraft in service on either side until the arrival of the jet age.

The inspiration, leadership and courage of Sir Geoffrey de Havilland, founder of the great company, pushed the project along as a private venture, using a plentiful supply of non-strategic timber. Non-strategic labour was also employed, which otherwise would have made little contribution to the war effort. As a result, de Havillands produced one of the most versatile and deadly aircraft of World War II.

The Mosquito fulfilled an incredible number of contrasting roles, from its original concept of a high-speed high and low level unarmed bomber, through photo reconnaissance, fighter -bomber, night fighter, intruder, bomber support, naval strike, anti-shipping, minelayer, pathfinder, high-speed communications aircraft, to the more mundane tasks of weather reconnaissance and target towing. It was also the only aeroplane capable of successful precision attacks on such difficult targets as Gestapo headquarters situated in densely populated areas.

Over 7,000 Mosquitoes were built in Britain, Canada and Australia.

Philip Birtles, who has worked 22 years at Hatfield, the home of de Havillands, has been able to tell this extraordinary story from the "inside", including revealing episodes during the construction of the prototype. He has interviewed many of the personalities involved in the design, production, development and operations, adding a new dimension to the entire history.

This book is very fully illustrated with many hitherto unpublished photographs from a unique collection of pictures from the de Havilland archives, wartime sources and individual collections.

Valuable appendices give details of specifications, production, service and surviving aircraft.

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**Philip Birtles**

JANE'S LONDON · NEW YORK · SYDNEY

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First published in the United Kingdom in 1980 by
Jane's Publishing Company Limited
238 City Road, London EC1V 2PU

ISBN 0-7106-0065-8

Published in the United States of America in 1980 by
Jane's Publishing Incorporated
730 Fifth Avenue
New York
N.Y. 10019

ISBN 0-531-03714-2

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Design by Bernard Crossland Associates

Printed in Great Britain by
Hazell, Watson and Viney Limited
Aylesbury, Bucks

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# AUTHOR'S NOTE

The amount of material already written about the Mosquito testifies to the success of this fine aircraft. In this book, while I had to include many of the highlights already covered by previous writers, I have also tried to include contemporary accounts by people concerned with the design, building, flying and maintenance of this aircraft. The different operational roles performed by the Mosquito brought widely differing types of action and danger. On night fighter and night intruder operations a crew could go a whole tour without a sight of the enemy. However, the fighter bombers, day intruders and anti-shipping crews were operating under much greater risks and sustained correspondingly greater losses.

To all those people who have helped with this book, particularly those named in the text, I owe a debt of thanks. Thanks are also due to my wife, Helen, for reading the text, and to Jeanette Waller for typing the manuscript. Those who flew in the aircraft probably owe a similar debt to the Mosquito, which either brought them home safely, or at least allowed them to survive incidents that may have had fatal consequences in many other aircraft. This book is dedicated to all those who designed, built, maintained and flew the Mosquito, and is also dedicated to the memory of those gallant people who failed to return.

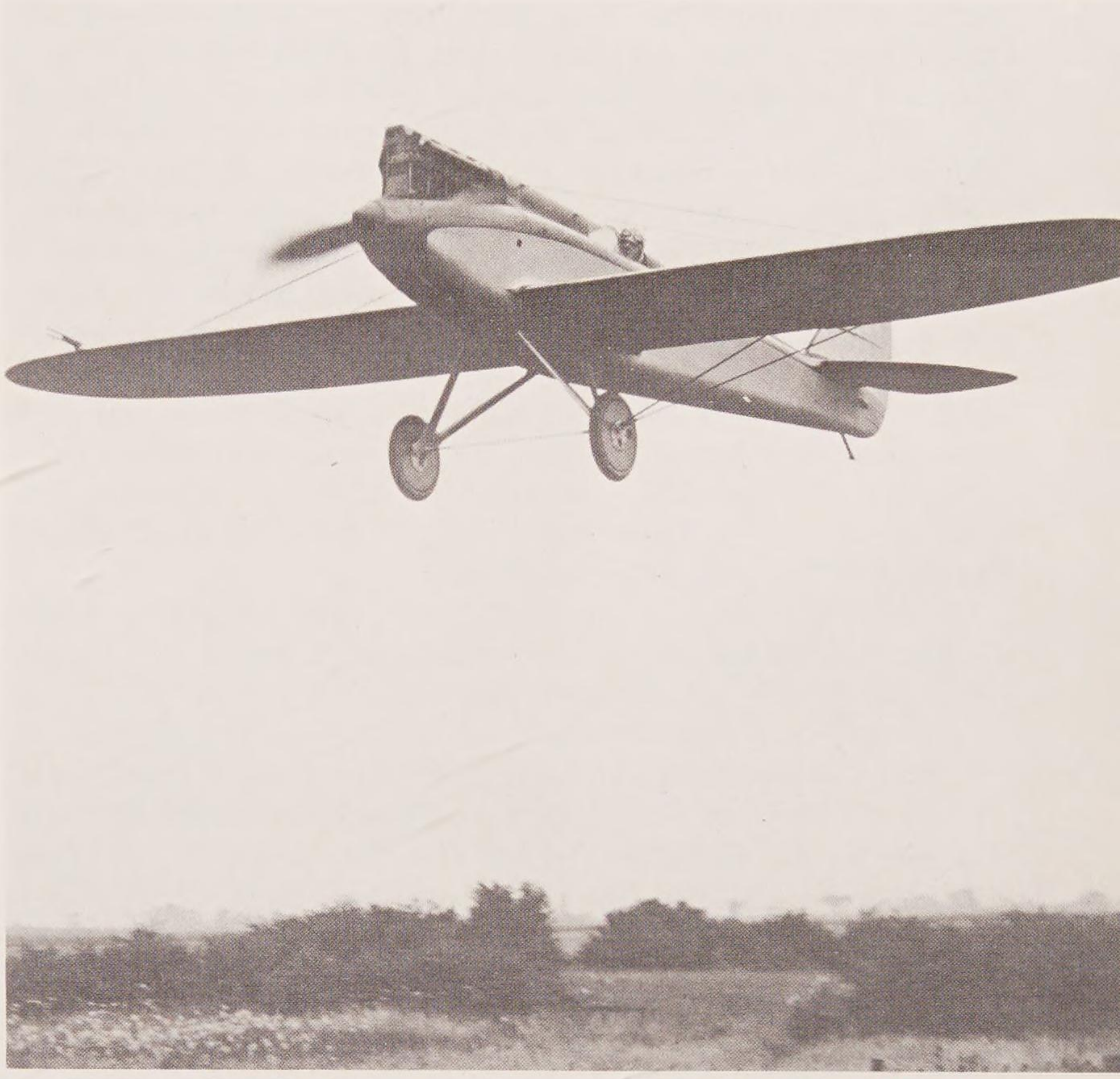
Philip Birtles, April 1980

# BACKGROUND

Conceived by Sir Geoffrey de Havilland and his Technical Director, C. C. Walker, the Mosquito was destined to become one of the outstanding aircraft of all time. In common with many other pioneer aircraft constructors between the two world wars, the de Havilland Company had survived largely on civil aircraft sales, with the occasional military contract helping to keep them up to date with the latest techniques, equipment and performance requirements. However, technical progress was very slow, but the Company's success in the civil market was greater than any of its contemporaries. After the light aeroplane contests of the early 1920s, Geoffrey de Havilland realised the impracticability of the specifications to which the competing aeroplanes had been built, and decided to design his own practical and robust training and touring aircraft which he called the Moth. So successful did this aircraft and its variants become that the public referred to any light aircraft as "Moth".

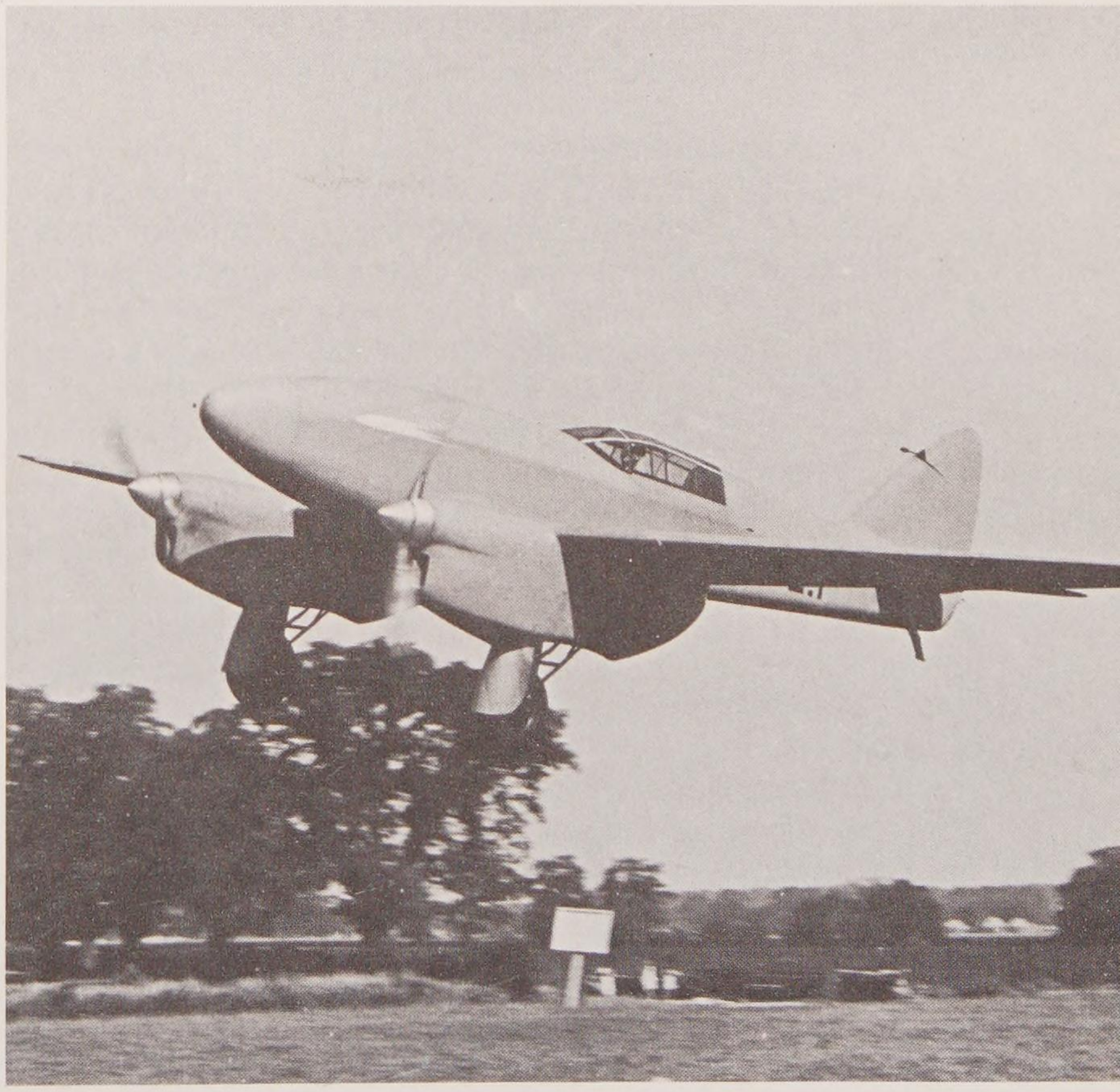
Geoffrey de Havilland had designed, built and successfully flown his own aircraft in September 1910, and it was this pioneering spirit which led to the Mosquito. De Havilland tended to go for maximum performance from minimum power, making the design as efficient as possible by careful attention to detail. An early example of this

**Geoffrey de Havilland, surrounded by models of his products, studying the clean lines of the Mosquito.**



**The D.H.71 Tiger Moth Racer, flying test bed for the de Havilland Gipsy engine.** *Flight*

**The D.H.88 Comet Racer, winner of the London to Melbourne air race in 1934.**



approach was the D.H.71 Tiger Moth Racer, a low-wing wire-braced monoplane designed as a test bed for the new de Havilland Gipsy engine. Weighing 410.4kg (905lb), this diminutive aircraft was designed round the small frame of Hubert Broad, the chief test pilot, and achieved over 299km/hr (186mph) on an engine developing 135hp.

The next evolutionary step leading to the Mosquito was the D.H.88 Comet Racer, an efficient high speed, long range aircraft, produced specifically for the London to Melbourne Air Race of 1934. When the details of the race to mark the centenary of Melbourne, were announced at the end of 1933, Britain had no suitable aircraft to enter. In the face of strong entries from America, in particular, the de Havilland Directors decided in January 1934, only 10 months before the race, that if sufficient orders were placed they would supply a suitable aircraft. On condition that orders were placed by the end of February, the price was to be £5,000 each, which was obviously less than the cost. A speed of 200mph was guaranteed, together with a long range, but no other details were divulged, even to the customers, in order to maintain the commercial secrecy. Three aircraft were ordered by the deadline, and the first flew only six months later.

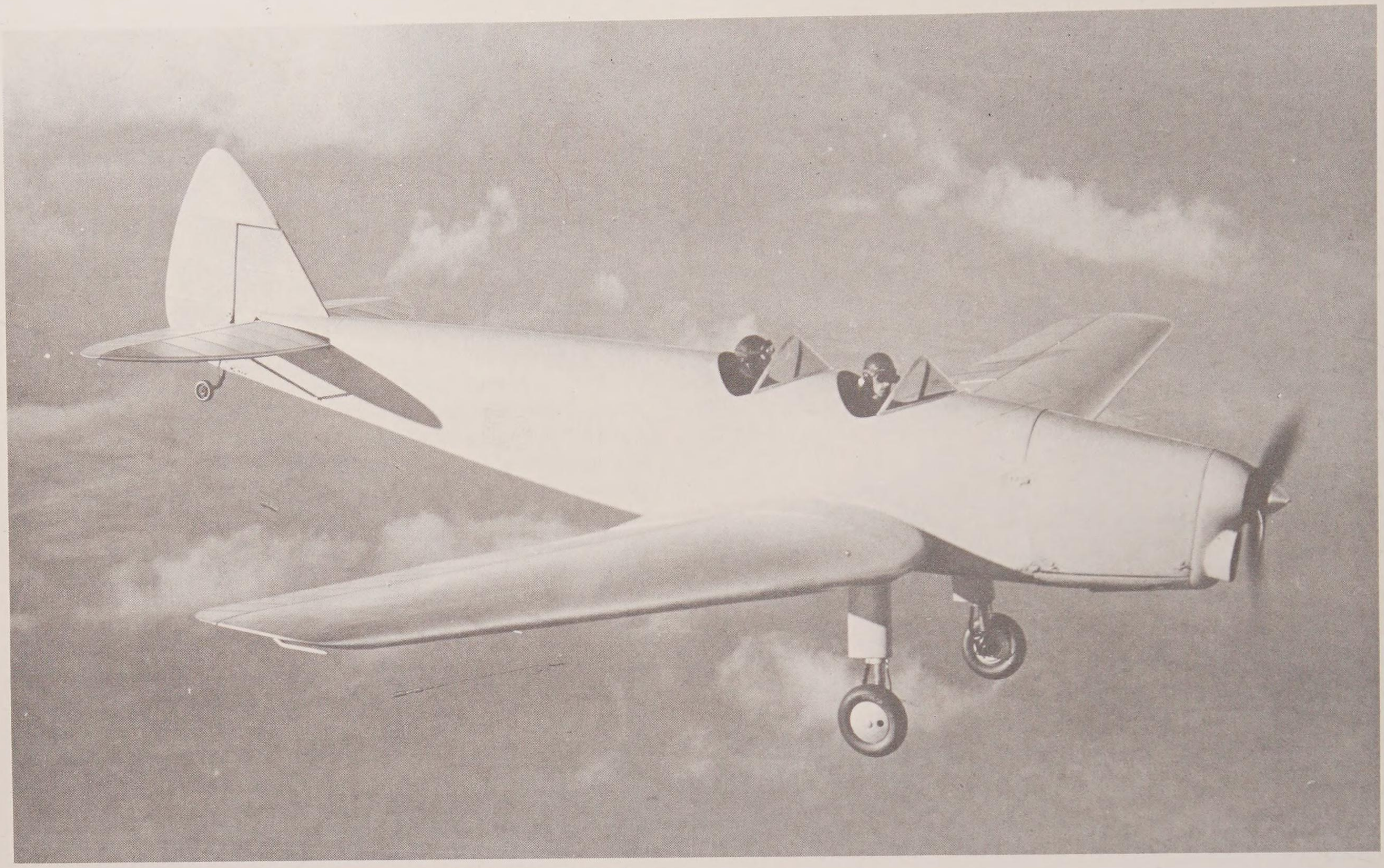
Designed by Arthur Hagg, the D.H.88 was a slim-fuselaged, low wing monoplane with retractable undercarriage, powered by two de Havilland Gipsy Six engines with rudimentary variable pitch propellers. The wooden structure, which was later to contribute to the design of the Mosquito, incorporated a stressed monocoque fuselage shell formed from diagonal plywood strips glued to give a very smooth and streamlined shape with the minimum of external fittings. So efficient was this aircraft that two of the three entered were placed in the first four. One, flown by Charles Scott and Tom Campbell Black, achieved first place, completing the 18,829km (11,700-mile) course in 70hr, 54 min and 18sec elapsed time, averaging 239.6km/hr (160mph). Cathcart Jones and Waller in D.H.88 G–ACSR were beaten by the Douglas DC–2 and gained fourth place in the speed section with a time of 108hr, 13min and 30sec, immediately returning to Britain with newsreel film of the winners and thereby gaining the record for the round trip. The third Comet had to withdraw owing to fuel problems. The winning Comet Racer, G–ACSS, is still preserved by the Shuttleworth Trust at Old Warden, and is expected to fly again as a reminder of this great event.

Stressed wooden structure was further used to advantage in the D.H.90 Dragonfly, the D.H.93 Don trainer and, on an even greater scale, in the D.H.91 airliner. To gain extra strength without too much weight penalty the Albatross fuselage was formed using balsa wood sandwiched between birch ply, giving a very sleek, smooth finish. The one-piece wing, on which the fuselage was mounted, had four closely-cowled de Havilland Gipsy King engines developing 525hp each and careful attention to detail gave a top speed of 362km/hr (225mph).

The wooden structure was not only light and smooth, but strong for its weight and easy to repair. This was demonstrated in August 1938, when the second prototype was involved with some overload take-off tests at Hatfield. It was landing at 1,361kg (3,000lb) overweight, and on the third touchdown the rear door sprang open and the fuselage broke its back, the front portion separating from the tail. No one was hurt, and within two weeks the break had been repaired and strengthened with an increase in weight of 5.6kg (12½lb). Similar ease of repair was to be demonstrated many times with the Mosquito from its earliest days.

**The D.H.91 Albatross airliner, powered by four Gipsy King engines, provided useful experience in the wooden structure adopted for the Mosquito.** *Flight*

G-AEVV
G-A

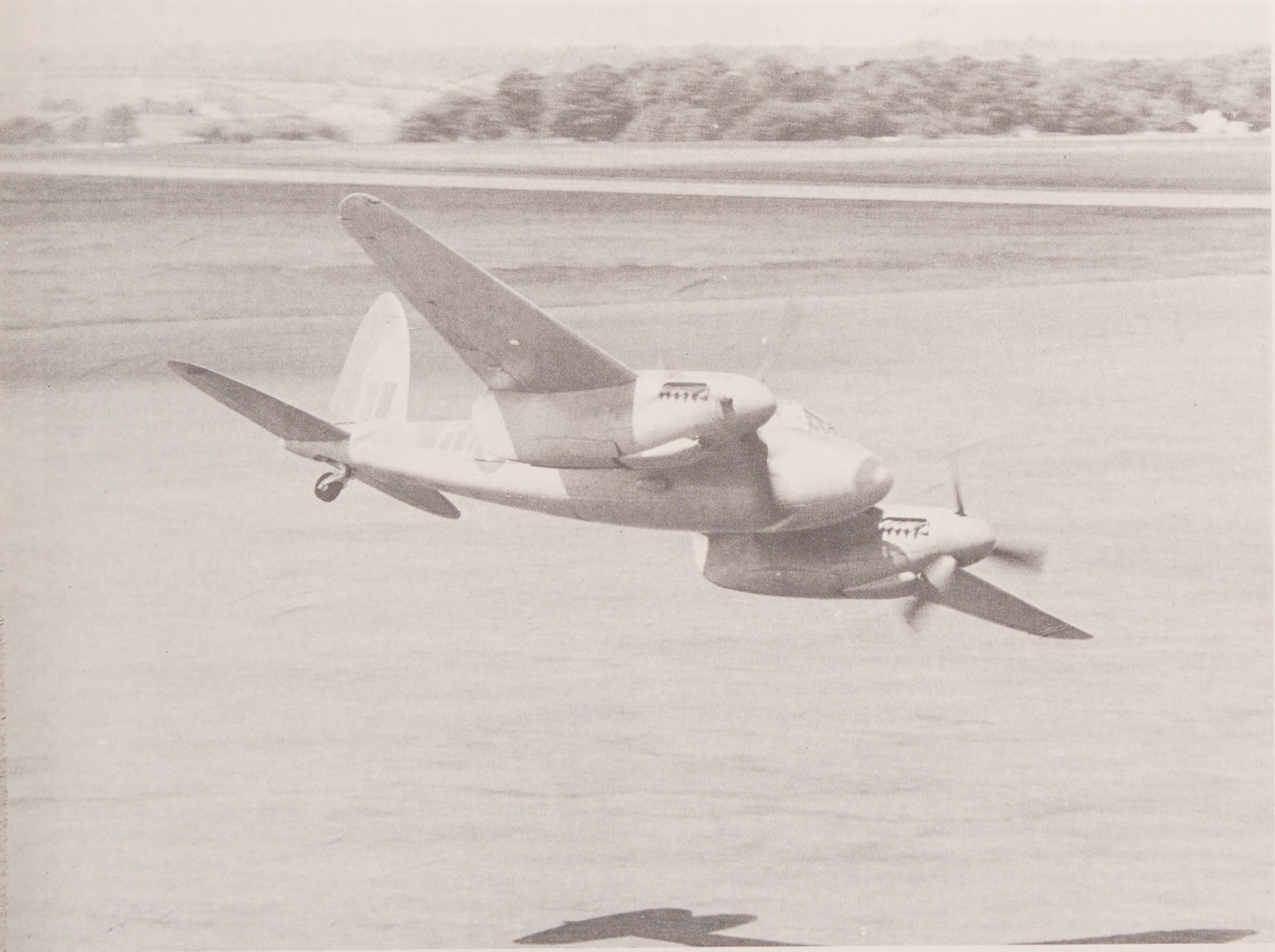


**The D.H.94 Moth Minor was a return to the simplest practical trainer and designed by a new young team, to give them first hand experience. Many of this team were later to play a key part in the Mosquito design development and production.** *Flight*

Another small link in the chain was the Moth Minor. This wooden two seat, low wing monoplane resulted from an attempt by de Havillands to return to the simple, cheap trainer and tourer. Its significance lay in the fact that Capt de Havilland formed a second young design team to produce this aircraft, so that under his watchful eye new talent could emerge, playing a comparatively major part in a simple aircraft. They were then better prepared to play a lesser part on the major project. Amongst these people were J. P.Smith, John Walker, Brian Hunter-Steen, John Cunningham and Geoffrey de Havilland, the founder's eldest son.

With the war clouds gathering, production of the Albatross, Flamingo and Moth Minor either ceased rapidly or, in the case of the Moth Minor, was transferred to Australia. Hatfield was kept busy producing Tiger Moths to train budding pilots, D.H.89 Dragon Rapides (known as Dominies in the RAF) for navigator training and communications, and Airspeed Oxfords for aircrew training. Also, many damaged Hurricanes were brought to Hatfield for repair. Although all this work was vital, it was not enough for the peace-loving Geoffrey de Havilland. If war was inevitable, it was clearly best to win it as soon as possible, and he knew that he had the means to that end. Why not, he reasoned, use the D.H.4 principle of World War One, when the bomber was produced faster than the fighters sent up to destroy it? Take a normal four-engined bomber and remove the armament, the extra crew required to operate it and the corresponding structure. Only two engines would then be required instead of four, and only two crew instead of up to ten men. It would use less fuel, be easier and cheaper to build and require less trained manpower, and because it would be lighter and smaller it would also be faster. Why not go one better, and design an aircraft which could be mass-produced using non-strategic material, such as wood, of which plentiful supplies existed, and use non-strategic labour, such as people from the furniture trade and other woodworking industries? Furthermore, why not disperse the work so widely amongst these woodworking factories that enemy attacks could not possibly stop production? Thus was conceived the Mosquito, Sir Geoffrey's brainchild and an answer to many prayers. The government, initially, showed not the slightest interest in it. Because fighters were so urgently required for the Battle of Britain, and existing four-engined bombers were needed to retaliate, no effort could be spared for such a radical concept. "Perhaps de Havillands would like to build wings for someone else?"

# MOSQUITO: PROJECT AND DESIGN



**The Mosquito – T.III RR299, maintained in airworthy conditions by British Aerospace shows the classic lines of this versatile aircraft.**

The origins of the Mosquito can be traced back to the issue of Air Ministry Specification P.13/36 on August 24, 1936. This called for a twin-engined medium bomber for world-wide use which could exploit the alternatives between long range and heavy bomb load by resorting to a catapult-assisted take-off when in a heavily loaded condition. For the time, the highest possible cruising speed of 442.5km/hr (275mph) at 4,572m (15,000ft) was suggested to reduce the time over enemy territory, the projected range being 4,828km (3,000 miles) while carrying a bomb load of 1,814.4kg (4,000lb). Consideration was given to combining the roles of medium bomber, reconnaissance and general purpose aircraft in one basic design, but in practice this tended to result in a "Christmas tree" aeroplane along the lines of a D.H.9A which did none of its alloted tasks well. Defensive armament was to consist of nose and tail gun turrets, and two 45.7cm (18in) torpedoes could be carried.

From their Albatross experience, de Havilland believed that the speed to be gained through attention to aerodynamic design was just as valid for a bomber as a fighter, and an adaptation of the graceful wooden airliner was considered, powered by two Rolls-Royce engines. On July 7, 1938, de Havilland sent a letter to Sir Wilfrid Freeman, Air Council Member of Research and Development, discussing the specification and suggesting the use of wooden construction as a means of producing the aircraft rapidly should war break out. Adequate supplies of suitable material were available, and the strength of wood was equivalent for a similar weight of aluminium or steel, except in tension. Not only would the use of wood be non-strategic, but so would the labour employed. Labour would come from the furniture, exhibition building and other allied trades, which otherwise would make little direct contribution to the war effort.

**Salisbury Hall, the moated stately home, which was taken over by the de Havilland Mosquito design team on October 5, 1939.**

Unlike metal, wood does not suffer from fatigue, and in the event of damage it is easy to repair. The fuselage was to comprise a moulded wooden stressed-skin shell consisting of a ply sandwich filled with light balsa wood to stabilise it and give strength. The one-piece wing was made similarly, the main spars being built up from relatively short overlapping planks which not only gave strength, but avoided the need of great lengths of straight timber.

It was felt by de Havillands that P.13/36 would not produce a satisfactory aircraft, as it was too large for the specified Rolls-Royce Merlin engines. However, a good bomber could be produced using these engines. In September 1938 the Munich crisis brought greater urgency to the deliberations, and the company settled on a new and smaller aircraft with a crew of two, sacrificing armament for speed and powered by two Merlin engines. The use of wooden construction was expected to save a year in the prototype stage, cutting delays in subsequent production accordingly.

Despite the urgency of re-armament the de Havilland proposals were not taken seriously, owing to official preoccupation with other projects. De Havillands therefore spent much of 1939 considering other approaches. The defensive armament of a conventional bomber, with its extra crew, structural weight, ammunition and fuel, could be as much as one sixth of the total weight. The larger structure took more man-hours and materials to produce, maintain and operate. The guns could only defend against fighters, and not against the hazard of flak. while the drag of the turrets only helped to slow the aircraft down and make it more vulnerable. De Havillands were convinced that the only answer was to build a fast, unarmed bomber with only two crew, which would be exposed to less risk for a shorter time, by outflying the fighters and avoiding flak. It would be able to make more trips delivering more bombs.

The official view of the performance estimates was pessimistic; it was feared that the enemy might produce faster fighters which would make the unarmed bomber a sitting duck. Additionally there was doubt that a wooden airframe could withstand the strain of being driven along by two powerful Merlin engines, though the wooden structure proved more resilient than metal in practice. It was also thought that the crew would be overworked, with the pilot having no relief on long flights and the navigator being responsible for the radio, bomb aiming and look out in addition to guiding the pilot to the target and back again.

Defensive armament was still deemed necessary, and it was estimated that its weight and the drag of the bulky turrets would reduce the speed by about 32.1km/hr (20mph). Without this defensive armament the aircraft began to show potential as a long-range escort fighter, as well as an unarmed bomber and reconnaissance aircraft. Sir Wilfrid Freeman, a senior government representative, was convinced of the potential of de Havilland's proposals and remained a firm ally, the design thereby gaining the alliterative appellation "Freeman's Folly". The proposal by de Havilland was for a two-crew, unarmed, twin-Merlin powered wooden bomber carrying a 453.5kg (1,000lb) bomb load over 2,414km (1,500 miles) with twice the wetted area of the Spitfire and twice the power. However, due to more efficient design, it would fly 32km/hr (20mph) faster, giving it the required advantage. As a result Air Ministry Specification B.1/40 covering an unarmed reconnaissance prototype, was drawn up to keep the programme alive, leaving the bomber and fighter versions for consideration at a later date.

To ensure secrecy and safety from attack, the key members of the Mosquito design team moved on October 5, 1939, to Salisbury Hall, a moated, historic house about six miles from Hatfield. The design team, led by R. E. Bishop, included J. P. (Phil) Smith, who had helped design the D.H.94 Moth Minor following his apprenticeship, Ralph Hare, who had started at Stag Lane, and Brian Hunter-Steen. All three were to remain with the company for many years, J. P. Smith becoming Divisional Deputy Managing Director of British Aerospace at Hatfield. Ralph Hare was Head of Structures at the time of his retirement in 1979 after more than 50 years service, and Brian Hunter-Steen was later responsible for the recruitment of undergraduates to British Aerospace. All three have many memories of their time at Salisbury Hall, which was generally a happy time, despite the long hours that were worked over a 6½-day week.

Phil Smith was working under Reg Hutchinson on the Mosquito elevators, although initially work was not urgent, owing to lack of decisions for the go-ahead. Alan Peters was in charge of the controls, assisted by Phil Smith, who subsequently became involved with the high altitude pressurised Mosquito Mk XV. The development work for this variant was done on a reject fuselage surrounded by wire mesh for safety and pressurised to 0.28kg/sq.cm (4lb/sq.in). Power was from two-stage Merlins, and although much of the design was done at Salisbury Hall, the aircraft themselves were modified at Hatfield to be able to reach the high altitude German Junkers Ju.86p raiders, which could fly at over 12,192m (40,000ft).

Ralph Hare moved to Salisbury Hall as part of the initial team of nine designers. The Mosquito remained a private venture owing to the more urgent immediate need for fighters for the Battle of Britain, which was gathering momentum. Work on the Mosquito could continue only under great secrecy, as much to avoid official prying as anything. The overall load factor was eight for the bomber version and higher for the fighter. Ralph worked under Mr D. R. Evans, who was responsible for the stress, working in parallel with the aerodynamicists. The general arrangement and preliminary design was settled by January 1940 and, being well before the age of the micro-chip, Ralph well remembers doing his calculations on a ten-inch slide rule, which he used regularly up to his retirement. Ralph was responsible for general aircraft balance and the stressing of the one-piece wing.

The small team was highly enthusiastic and worked very hard, often from 07.00 in the morning, and did their share of fire watching. A working day lasted from 8.00 a.m. to 7.00 p.m. with a finish at mid-day on Sunday. This pressure was maintained during the first half of 1940 to get the vital drawings cleared for manufacture to start.

Before the first bomber had flown many other versions were studied at Salisbury Hall, and Ralph Hare remembers the fighter prototype taking off from the field to the south of the house on May 15, 1941, to save the month-long dismantling and re-assembly time required for a move by road to Hatfield. This unusual flight was made by Geoffrey de Havilland Jnr, then the chief test pilot, accompanied by Works Manager Fred Plumb. The aircraft was made as light as possible and some trees had to be cut down to give enough room for the 411.4m (450-yard) downhill slope take-off run. Percy Grigsby remembers having to hammer in the engine back plate to give clearance for the propeller, and Brian Hunter-Steen tells the unusual story of the local farmer who heard of this take-off and immediately started ploughing the field to shorten the take-off run still further. It was therefore a surprised farmer who nearly had his hat blown off when the Mosquito took off over his head. Despite the farmer's antagonism towards the aviation activities, one of the de Havilland team married his daughter.

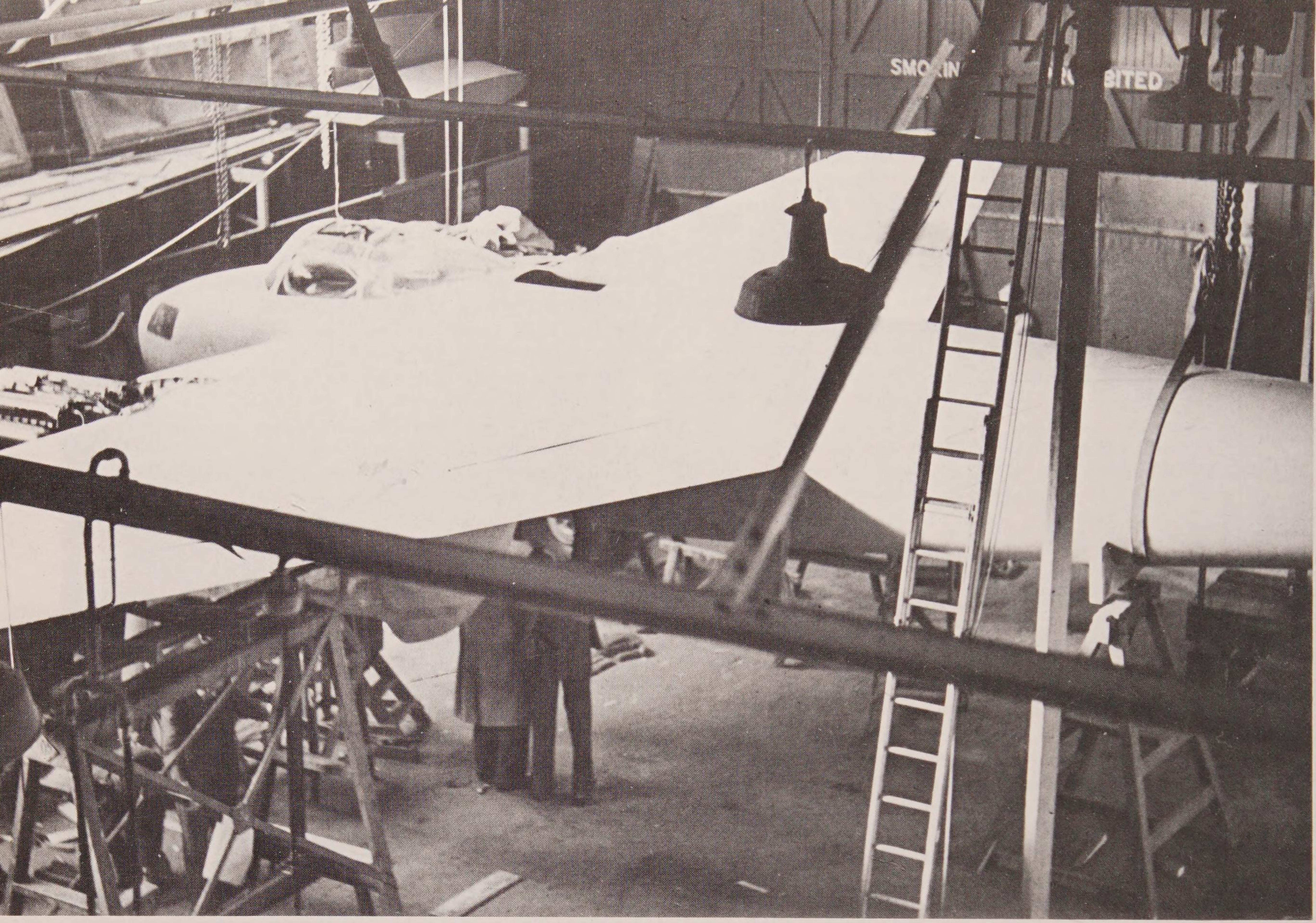
The Salisbury Hall moat was, of course, a hazard, especially the rope swing bridge across to the Mosquito hangar. Some people ended up in the muddy water. King George VI visited Salisbury Hall and met many of the team, and Winston Churchill was also a visitor to the house, which at one time belonged to his mother. Delays were caused by threatened raids and a number of bombs fell across adjacent fields, although none hit the house or hangars. Sir Geoffrey de Havilland was a frequent visitor to Salisbury Hall to see how the project devised by him and C. C. Walker was progressing. In April 1942 Ralph moved back to Hatfield with the rest of the team. Ralph remembers a Ju.88 bombing Hatfield. It was rumoured to have been flown by a past German student of the de Havilland Aeronautical Technical School, and although a number of employees were killed and Mosquito material destroyed the enemy aircraft was hit by the gun on the airfield and crashed close to the County town of Hertford, a few miles to the east. As a result production was dispersed so that there was no possibility of enemy effort disrupting future production.

Brian Hunter-Steen, a young member of the design team, arrived at Salisbury Hall in April 1940 to become one of the last members of the group, which was by then working under full pressure. He shared a wooden office at the side of the house with Phil Smith, Frank Marking and David Raynes, helping with the hydraulic installation design. The prototype was constructed using initial schemes before production drawings could be completed, the whole thing being built in a very short time. Brian remembers the camouflage, which included pulling tarpaulins over the cars to maintain the site's rural appearance from the air, and he saw the flight of the fighter prototype from Salisbury Hall. Although the site was secret, no passes were required and it was an easy atmosphere. Everyone lunched together, from the chief designer to the junior draughtsman, which encouraged the close team effort.

A particularly exciting event was the landing by parachute of a German spy near Salisbury Hall during the hours of darkness on Tuesday May 13, 1941. Karl Richter was, however, merely a courier bringing funds for another German spy, who had run short of cash owing to the delayed enemy invasion. Richter was not particularly well briefed. Having hidden for nearly 24hr in a wood close to his landing point, about two miles from Salisbury Hall, he emerged. Within a short time the suspicion of a lorry driver had been raised when the stranger was less than helpful with his directions, and a local policeman was put on to him, questioning Richter within an hour of his coming into the open. His buried parachute and equipment were uncovered and he was taken to Wandsworth Prison ready for his trial on October 21, the verdict of guilty being pronounced four days later. Karl Richter was hanged at Wandsworth on December 10, and although there was suspicion of German knowledge of the Mosquito, the landing by parachute so close to the birthplace was mere coincidence.

Bob Snedden, known as Jock from his obvious Scottish origins, was a pattern maker who came south for work. His skills were used on the building of the Mosquito Prototype at Salisbury Hall, where one of his jobs was to plane level the laminated main spar using a very long smoothing plane, which he still possesses. He worked on the night shift, and has vivid memories of his time at Salisbury Hall. He, and many of his colleagues, caught the bus from St Albans, having travelled from around the district, and there they were, in the middle of the night, getting off in a large group and walking down a track in the dark. They could hardly be farm workers, and doubtless other passengers on the buses wondered what was going on.

Because of the blackout regulations no light could be shown outside, although the roof of the Mosquito hangar was so perforated that light used to escape as easily as the rain leaked in. The nearest shelters were about 45.7m (50 yards) away, so a guide rope was stretched from the hangar door. On the occasion of one alarm, they all ran out in the dark following each other down the rope and ended up in a heap about halfway. A local horse was standing with its head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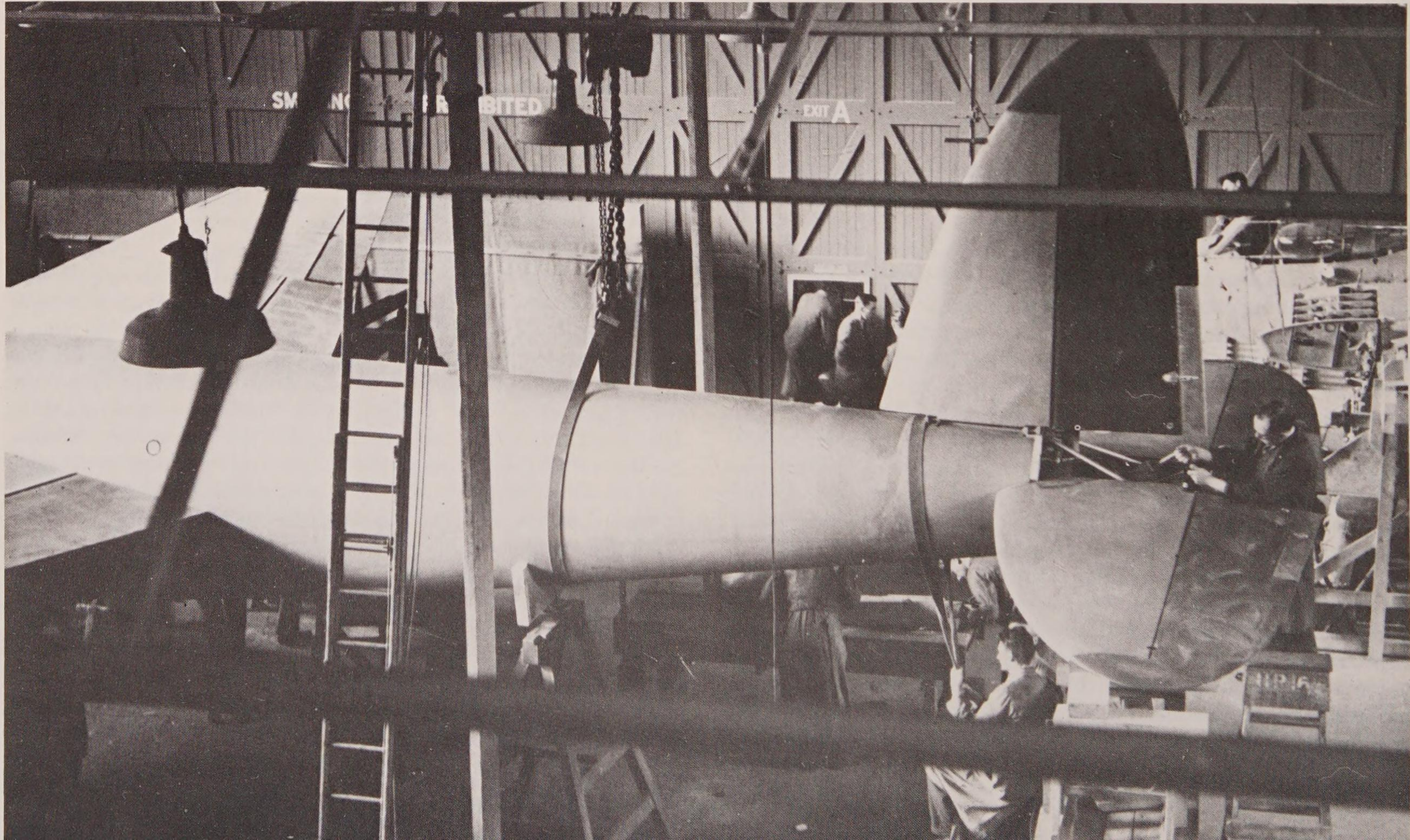
The prototype under construction at Salisbury Hall, with the mock-up to the rear.

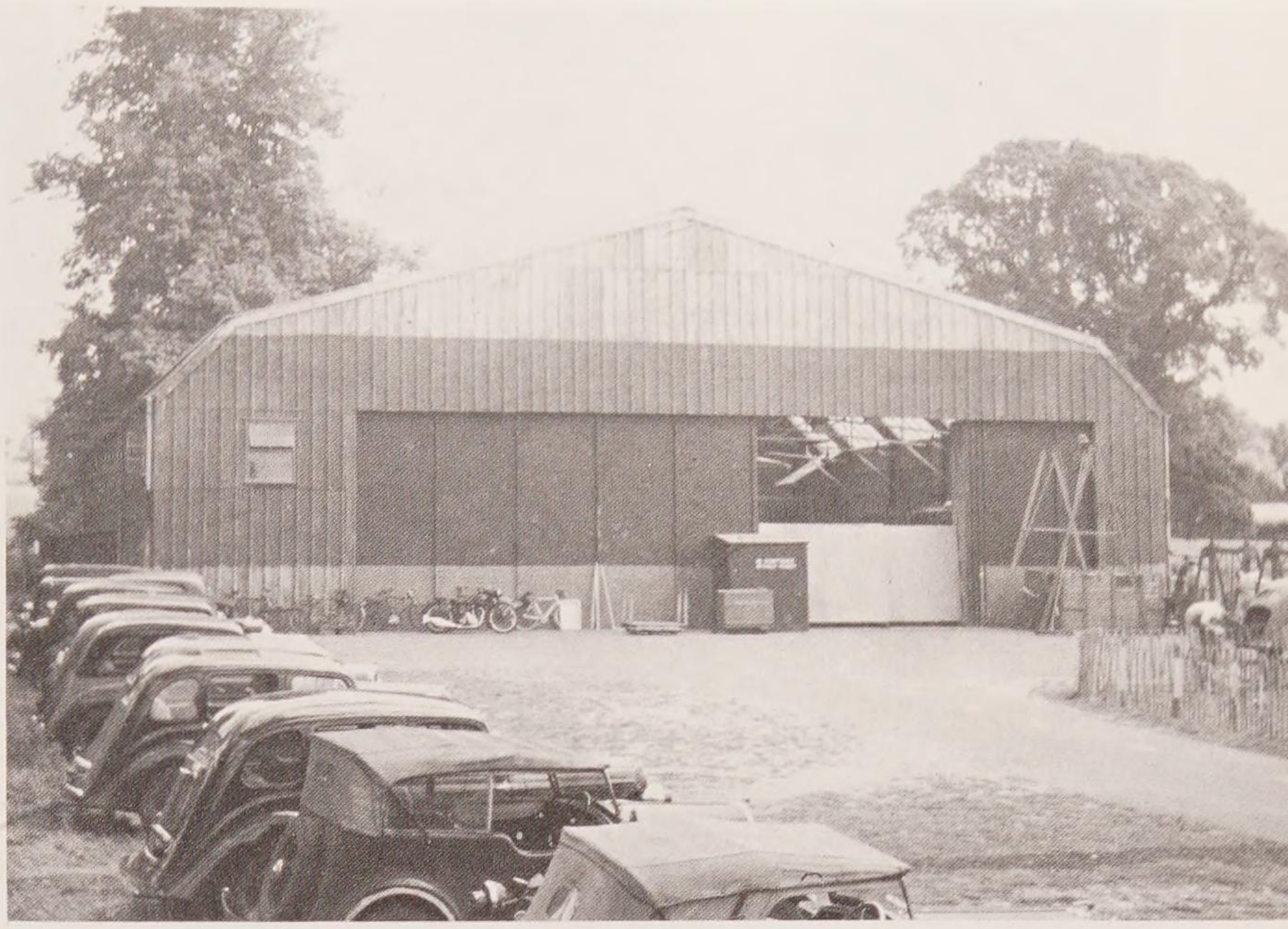

SMOKING PROHIBITED
EXIT A

over the rope, and as the first man came running blindly down to the shelter he collided with the surprised nag, creating utter confusion.

When a stick of bombs was dropped within about half a mile, Bob and his colleagues went to investigate, but returned rapidly when some were found to be unexploded and could have had delayed fuses. Perhaps the closest the site came to destruction was when one of the first German magnetic land mines was dropped. As it came down its parachute became caught in a tree and lowered it gently to the ground. If it had landed normally it would have flattened Salisbury Hall and the hangars, but instead it was dissected and its secrets made known.

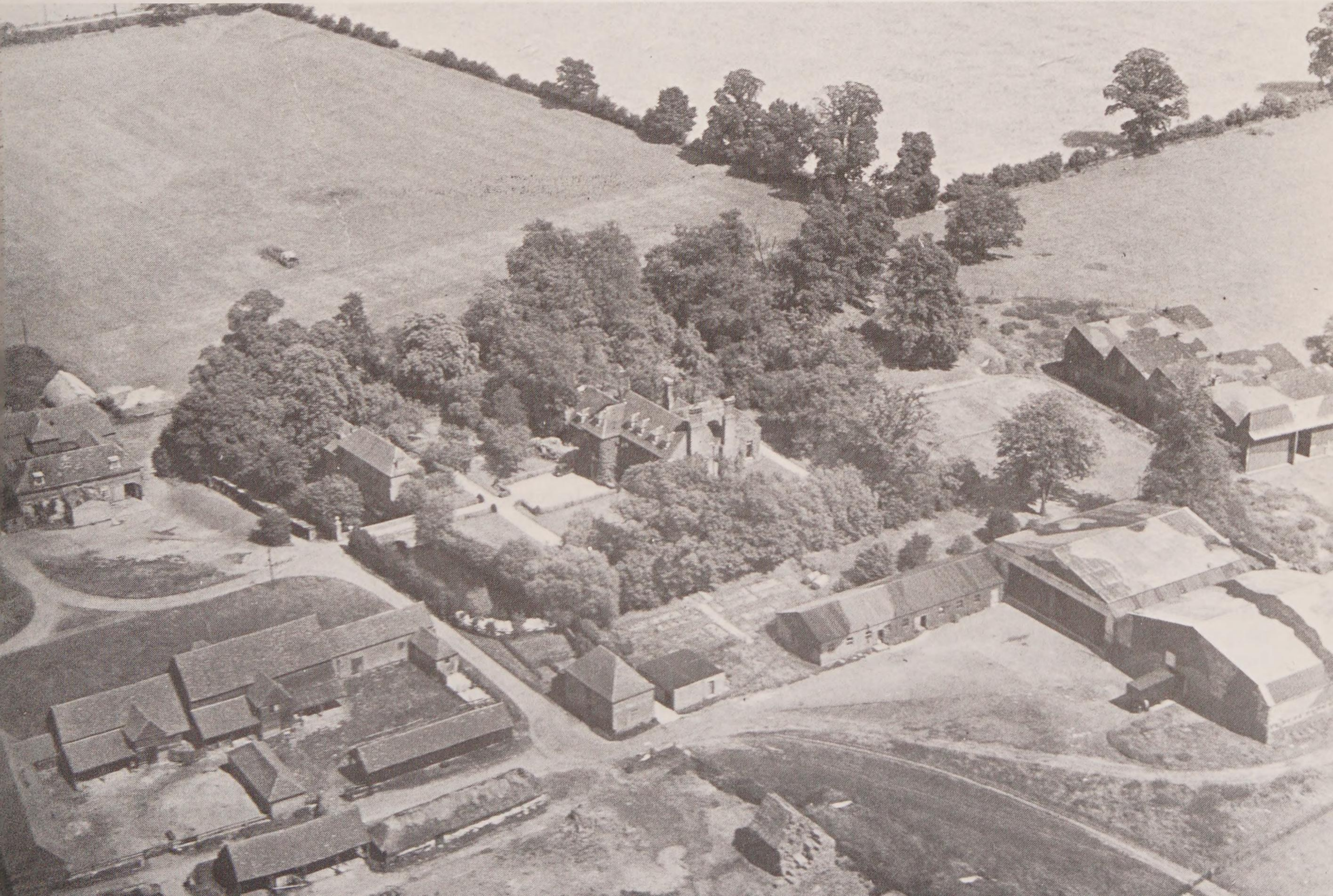
Initially a single-bay hangar, in which the first prototype Mosquito was built, was constructed across the moat, but as further aircraft were built a second bay was added to one side for detail assembly, so that final assembly could be completed in the original bay and the completed aircraft rolled out of the sliding doors. The door track can still be seen, although most of the original buildings are long gone. Close to the front of the original hangar door, a long wooden hut was erected which became the sheet metal workshop. Nell Gwynne's Cottage just across the moat was the raw material store.

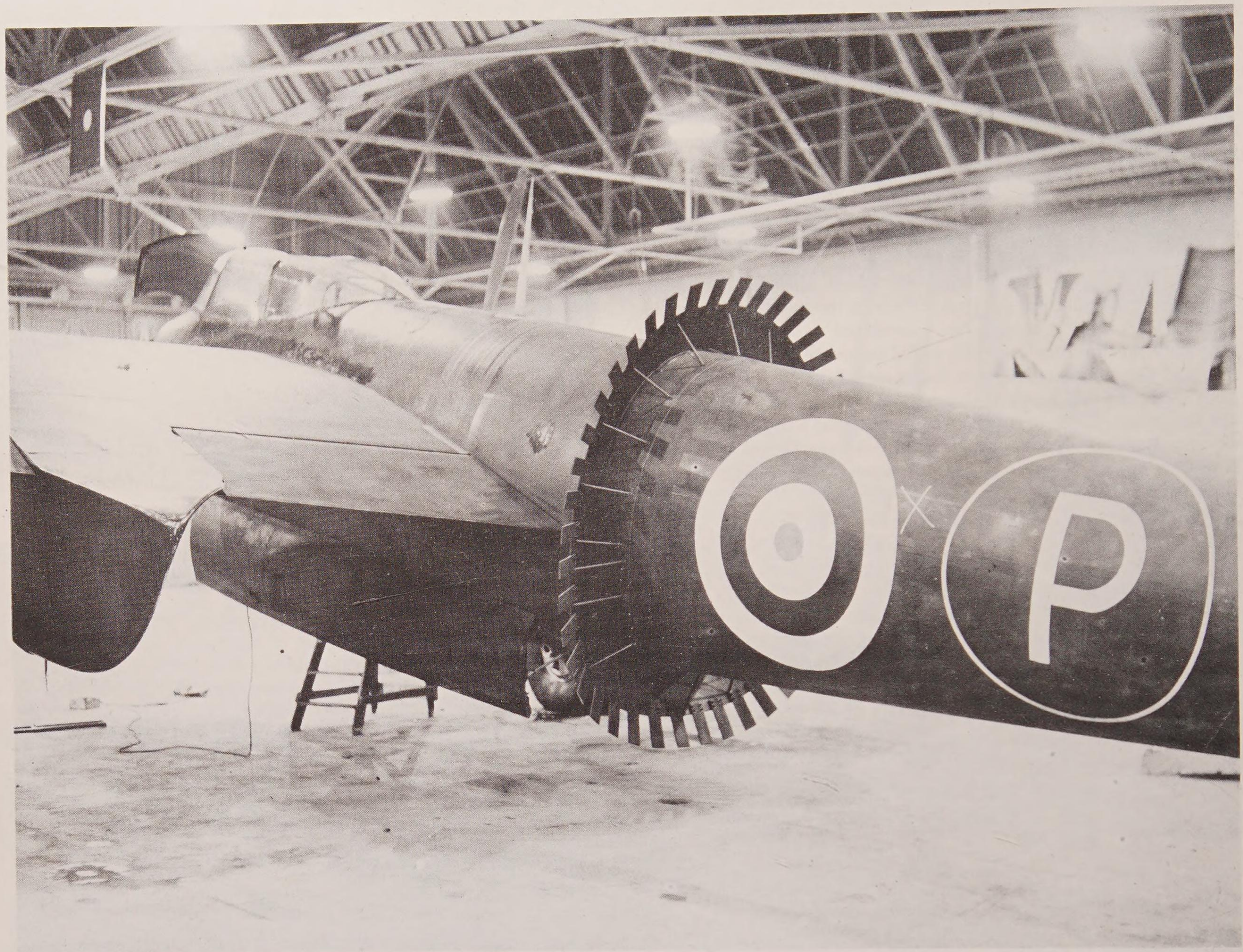
Amongst the day shift workers were Frank Eldridge and Tommy Adamson, who have amusing memories of their times at Salisbury Hall. Despite working hard for long hours, the team was compact and had a purpose, which created a happy atmosphere. Frank was a joiner before he entered the aircraft industry, and was one of about 150 working on the mock-ups and early prototypes in the two bays of the hangar. Both Frank and Tommy remember two of the



**The original single bay hangar in which the prototype Mosquito was assembled in great secrecy at Salisbury Hall. Although this building has now gone, as well as the surrounding trees, the door track can still be seen on the ground.**

**Salisbury Hall taken from the air in September 1945 showing the two bay hangar on the lower right where the Mosquitoes were built. The sheet metal shop and canteen building is at the front of the hangar. Beyond the two bay hangar is the Airspeed hangar where Horsa Gliders were constructed.**





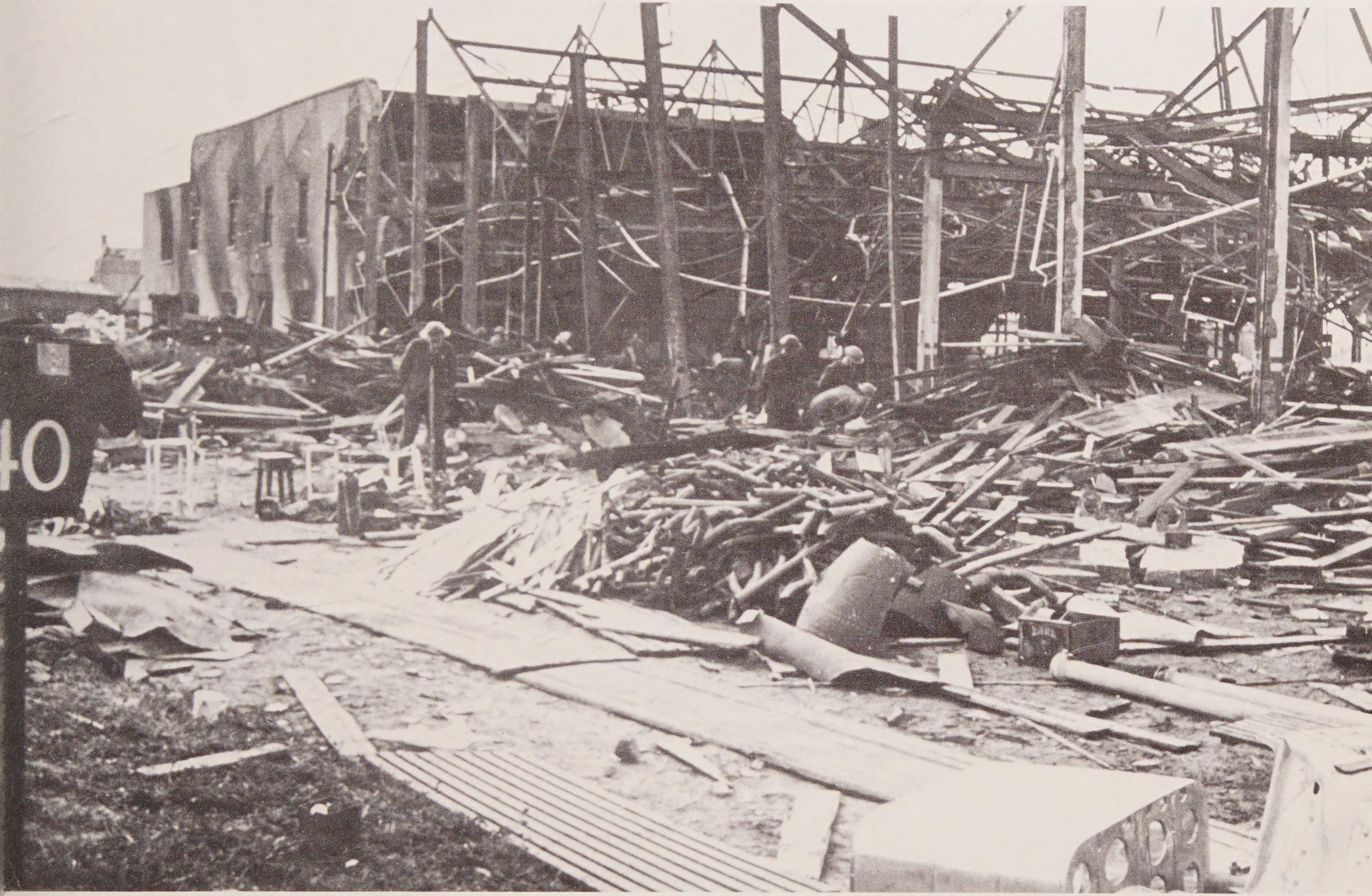
**The Youngman frill airbrake around the Mosquito fuselage was not successful and was abandoned in favour of using fine pitch on the propellers and opening the radiator flaps.**

Mosquitoes flying out of adjacent fields, the first across the field to the north of Salisbury Hall and over the Bell public house, and the second from the top of the hill to the south of the hangar, taking off over the site of its construction. Ditches had to be filled and hedges cut down to move the aircraft into position, and it was the second aircraft which the farmer tried to stop by ploughing the field as mentioned previously. However, it was not easy to move the earlier Mosquitoes out by road, as the wing would not pass through the gate and it had to be lifted over as the lorry moved slowly out. The team often relaxed for an hour or so in the evening by having an impromptu party in the canteen with plenty of beer provided.

In the winter the public transport sometimes failed to run, and some of the workers had to walk about ten miles each way to and from Welwyn Garden City. On reaching work the conditions were not good in the hangar, where the heating was inadequate. Most of the shop floor team returned to Hatfield in February 1942, leaving a group of Airspeed Workers building Horsa glider prototypes and a special bomber version of the glider. This little known Horsa bomber, of which a single prototype was built in great secrecy, was intended to carry one of Barnes Wallis's 5,443kg (12,000lb) "Tallboy" armour piercing bombs to be used on the German battleship *Tirpitz*. Fortunately, it was found possible to adapt the Avro Lancaster for the job, so the Horsa bomber project was abandoned after its first flight.

In 1945 and 1946 the de Havilland Aeronautical Technical School took up residence in the Mosquito hangar, while the Airspeed hangar was moved to a new site at Astwick Manor to become the new Technical School. When the apprentices moved out, the old sheet metal shop sheds were moved to Hatfield, where they served as pilots' offices, library and accommodation for suppliers' representatives until demolition in 1979. The majority of the Mosquito buildings were demolished and replaced by farm buildings which have now been adapted to form part of the Mosquito Aircraft Museum, enabling the original prototype Mosquito to be preserved, together with other de Havilland products, at the place where it was conceived.

# BOMBER DEVELOPMENT

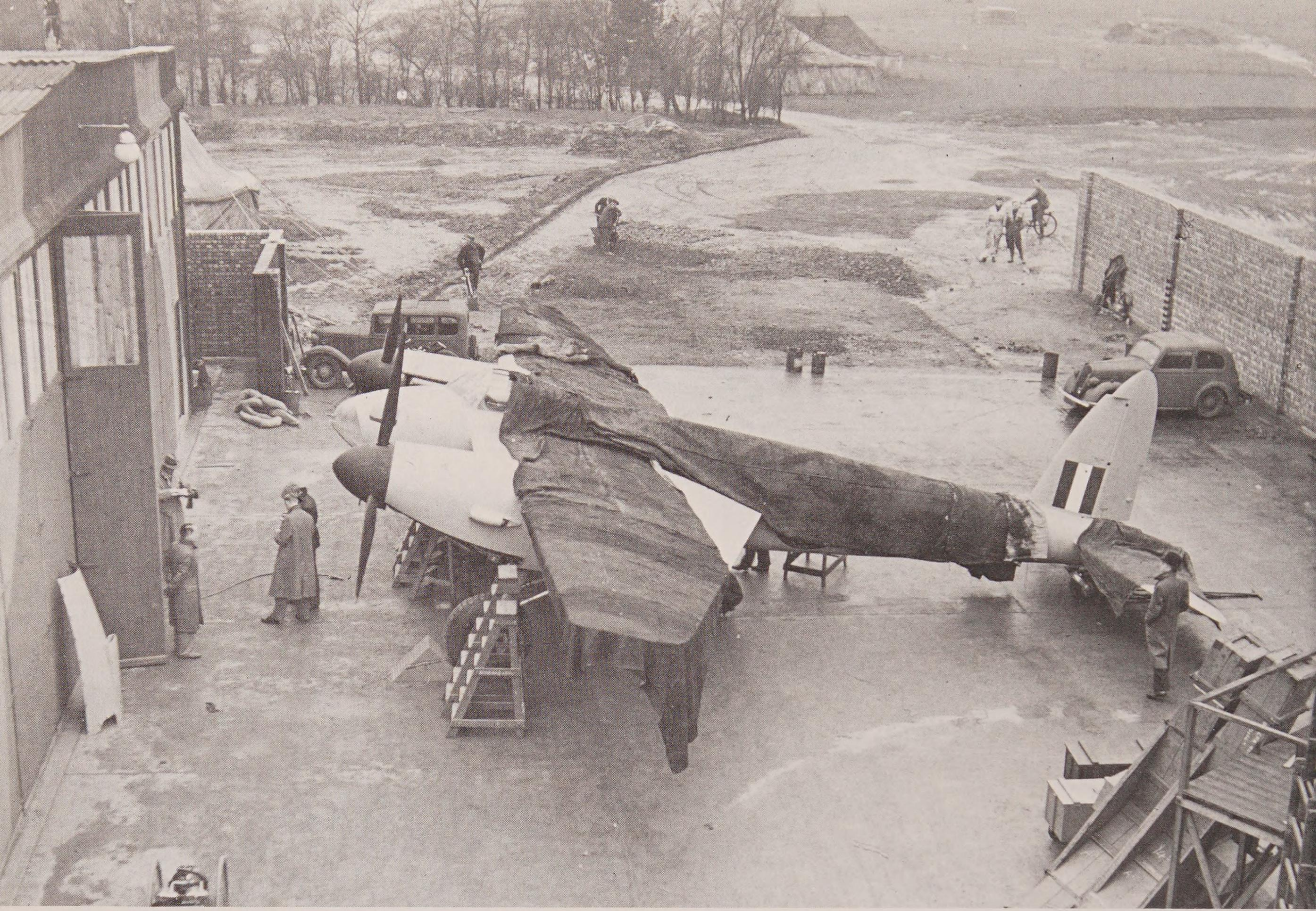


**Damage to the 94 Shop at Hatfield following the bombing by a Ju-88 (which was shot down) on October 3, 1940.**

As the design of the unarmed bomber progressed, it was realised that the same aircraft could be simply adapted to make it an ideal long-range escort fighter. Three times Lord Beaverbrook, then Minister of Aircraft Production, told Sir Wilfrid Freeman that he ought to stop Mosquito work, but as he failed to give a definite instruction, it continued. Beaverbrook was interested only in aircraft which would be available by early 1941, so to keep the project alive 50 were promised by July of that year.

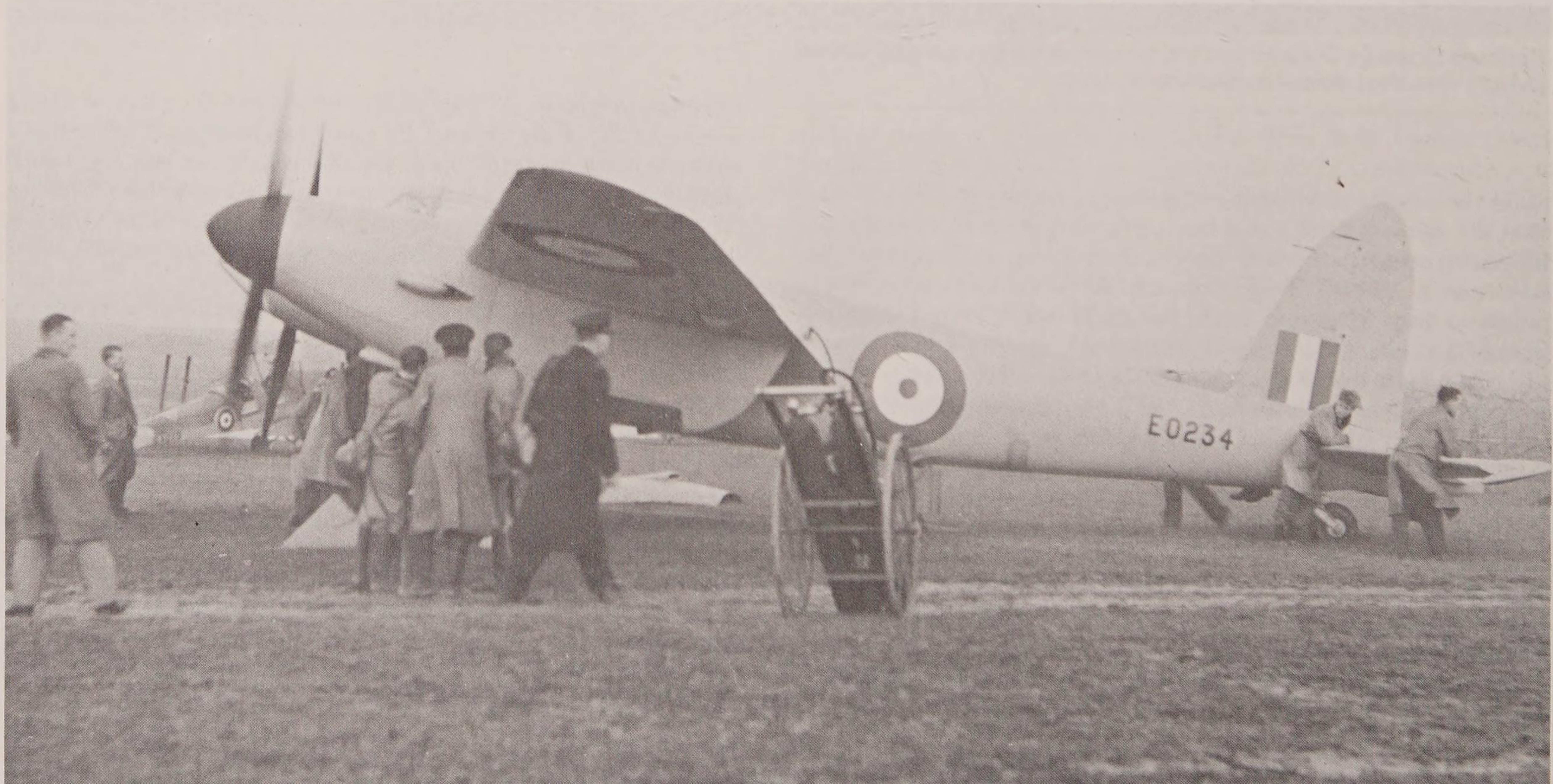
When Paris fell all effort was directed into types which could be readily produced, such as the Hurricane, Spitfire, Wellington and Blenheim. Work on the Mosquito was effectively stopped, because de Havilland were unable to purchase materials, and work continued at Hatfield on Oxford and Dominie aircrew trainers, Tiger Moth trainers which were having bomb racks fitted, and the repair of battle-damaged Hurricanes. A plea was made to Lord Beaverbrook to reinstate the work on the B.1/40, the company demonstrating that the metal used would be light, high-strength castings weighing 113.4kg (250lb), which took the place of all but 13.6kg (30lb) of the forgings. Precision machining was reduced to a minimum, an example being the main undercarriage leg, which used simple rubber in compression for shock absorbtion. With a firm promise of 50 Mosquitoes to be delivered in 1941 the work was allowed to continue, provided that it did not interfere with other activities.

Much time was lost due to air raids in the autumn of 1940, bombs falling within a mile of the Hatfield factory one day in every five. To reduce these delays people were asked to continue working after the sirens, until there was warning of imminent danger over loudspeakers. On October 3, 1940, 21 people were killed by the only bombs to fall on the factory, and a further 70 were wounded in the daylight raid recalled by Ralph Hare in the previous section. Despite the rumour that the German pilot was previously a student of the Technical School, there is no evidence to support this, as the original target of the Ju.88 was Reading, which was obscured by bad visibility. Hatfield was found by chance, and about 80 per cent of the raw materials and much of the work in progress was lost when the bombs fell in the area of the old D.H.94 shop, hitting the Technical



The yellow painted prototype rolled out at Hatfield for the first time on November 19, 1940, and covered in tarpaulins for camouflage.

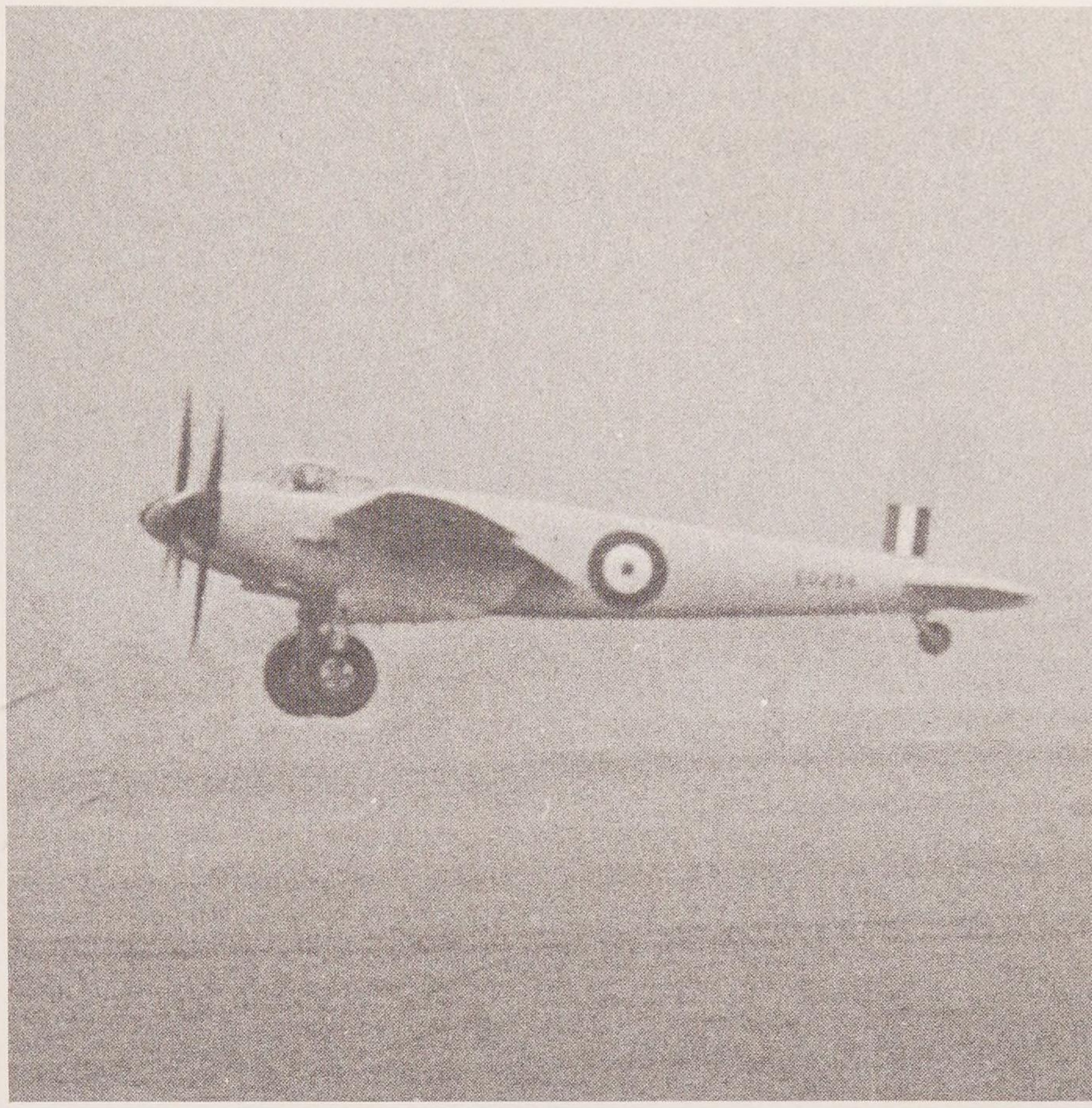
The Mosquito prototype with Class B markings E0234 on engine runs prior to first flight.



School offices and the Airspeed design office. Another loss was the surviving D.H.71 Tiger Moth Racer stored in the roof.

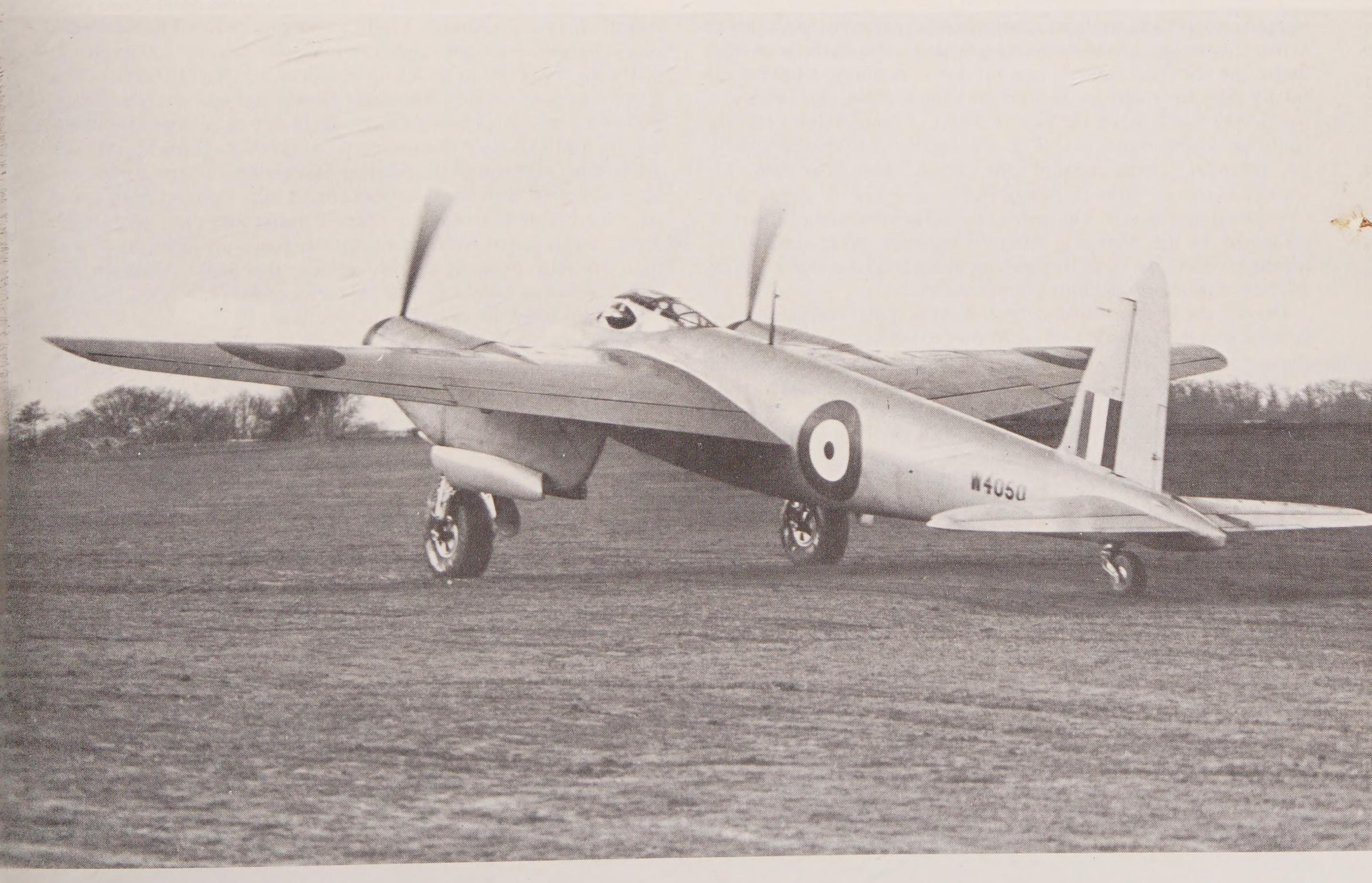
On November 3 the yellow-painted Mosquito prototype was moved to Hatfield by road in two main sections, the fuselage and one-piece wing. The tall fin luckily passed beneath the unanticipated hazard of overhead power cables. Following re-assembly in an isolated hangar, the prototype was pulled out partially covered in tarpaulins for camouflage and readied for engine runs and taxiing trials by Geoffrey de Havilland Jnr (Chief Test Pilot since October 1, 1937) which commenced on October 24. The next day, following a short hop, the prototype was taken up for the first time, taking off from the grass airfield at Hatfield for a 30-minute, trouble-free test, when it reached 353km/hr (220mph) and the undercarriage was retracted. The aircraft carried the "Class B" marking E0234, as it was still, strictly speaking, a private venture, although it soon acquired the official identity W4050.

This first aircraft became the principal experimental Mosquito, initially checking the aerodynamics, one of the few major snags being engine cowling problems which led to the shutting down of the starboard engine on the 30th flight. The prototype was put on show to Lord Beaverbrook and other Senior Ministers and Senior Military Officers at Langley with other new British combat aircraft



**A poor quality photo of the maiden flight of the Mosquito from Hatfield on November 25, 1940 by Geoffrey de Havilland Jnr.**

**The prototype, officially adopted as W4050 taxies out for take-off. This aircraft had short engine nacelles and one piece flaps used only on the early Mosquitoes.**



on December 29, and created a good impression. The following day de Havillands were instructed to increase productive capacity in anticipation of an order for 150 Mosquitoes to follow the initial 50.

On January 11, 1941, de Havillands were told that, of the remaining aircraft in the initial batch, one was to be a reconnaissance prototype, followed by 19 production aircraft, and the balance of 28 would be fighters. Although no bombers (the original role for the aircraft) were included, they were likely to be in the next batch, so development flying continued in all three roles, a fighter prototype having been called up in the initial batch in July 1940.

The most obvious external change to the prototype was the rearward extension of the engine nacelles to prevent tailplane flutter, which meant dividing the flaps either side of the fairing. This modification was incorporated in all but a few of the earliest production aircraft. During these initial tests, the predicted speed of 621km/hr (386mph) was reached. In preparation for the official trials at Boscombe Down, the upper surfaces were camouflaged and a yellow 'P', denoting a prototype, was marked on either side of the fuselage.

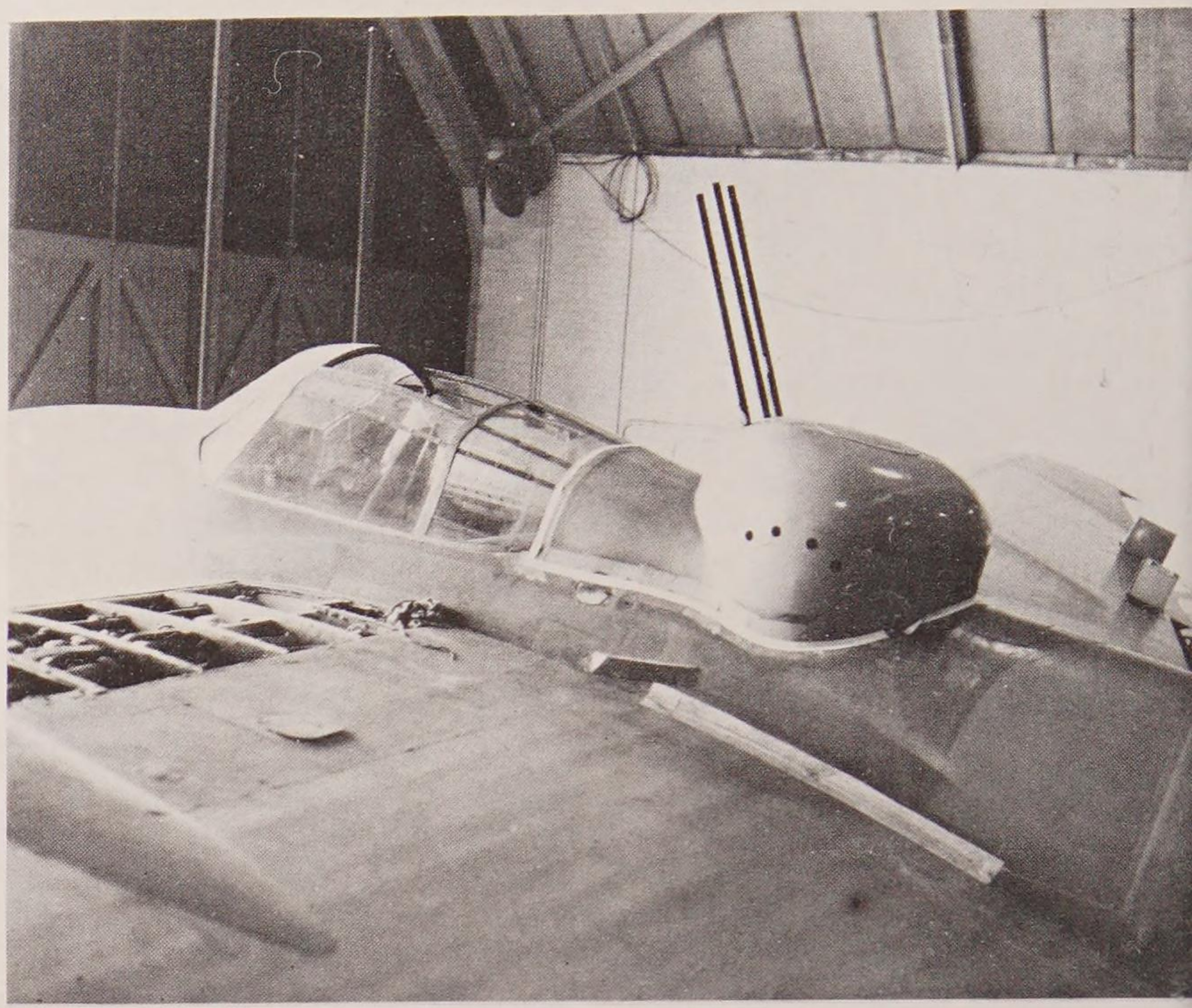
The Mosquito was despatched to the Aeroplane and Armament Experimental Establishment (A & AEE) at Boscombe Down on February 19, but the company was surprised by the initial lack of urgency to start the trials. There was still scepticism about the capabilities of the Mosquito, but this was quickly dispelled once flying commenced. So surprised were the trials personnel at the speeds attained that the performance was double-checked, and when the results confirmed that the aircraft flew about 32km/hr (20mph) faster than the Spitfire, a number of official visitors travelled from London to see the aircraft for themselves.

Then came an incident which could have spelt disaster, had the aircraft not already started to prove itself. As the prototype taxied across the bumpy, muddy airfield on February 24, ready for its 57th flight, the tailwheel jammed in a rut due to castoring trouble, and the fuselage fractured just behind the wing trailing edge. This was the first occasion when the ease of repair of the wooden structure could be demonstrated, and R. E. Bishop, the chief designer, drew an irregular shape around the break and instructed his woodworkers to make a patch inside and out to repair and strengthen the fracture. This patch can still be seen on the preserved prototype in the Mosquito Aircraft Museum. After repairs the prototype flew back to Hatfield on March 15 for some minor adjustments before continuing its official trials.

Despite the broken fuselage the A & AEE report was most satisfactory, and the Initial Handling Report dated March 3 stated that the aircraft was pleasant to fly, with light and effective aileron control. Take-off and landings were straightforward. The aircraft stalled at 168.7km/hr (105mph) clean and 144.7km/hr (90mph) flaps down and was flown up to 515km/hr (320mph) Indicated Airspeed. Top Speed in Full Supercharger gear was found to be 624km/hr (388mph) at 6,705.6m (22,000ft), and although the greatest height reached on test was 9,052.5m (29,700ft), the estimated service ceiling was 10,332.7m (33,900ft).

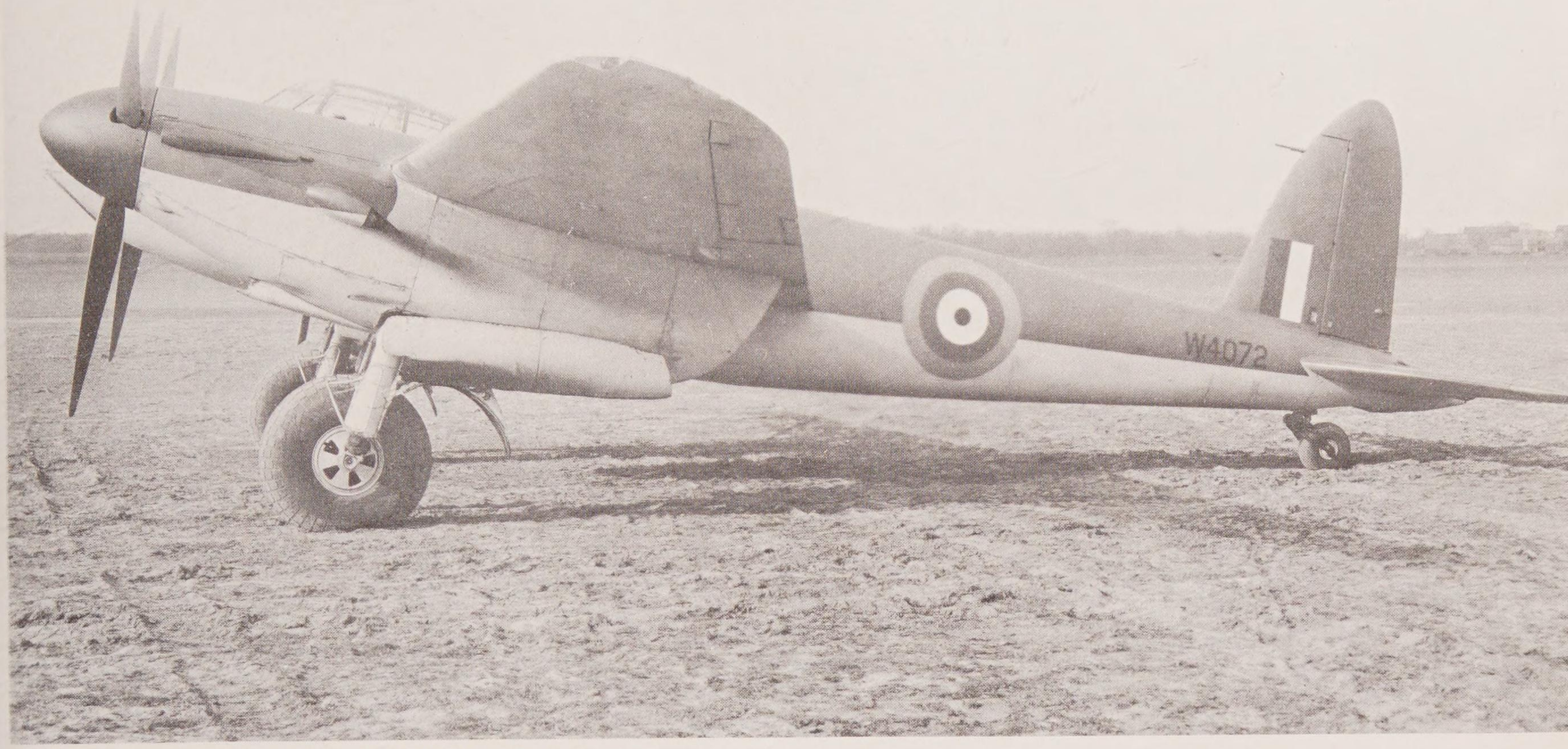
The general comments were also favourable, setting the seal of success on the aircraft. If Geoffrey de Havilland Jnr had not drawn attention to buffeting, it probably would not have been mentioned. For the fighter version, a different door would be required, and the lack of an internal handle on the existing door was obviously criticised. Although the side-by-side seating for the two crew was rather cramped, the heating was good. The seating was never improved, and at times the Mosquito cockpit was, if anything, overheated by the radiators positioned in the wing root either side of the cockpit. The aeroplane handled well on the ground with a pleasant ride and efficient brakes. The rate of climb and acceleration were good and the aircraft handled well at all speeds.

During further company trials, maximum level speed at full throttle height (maximum height at maximum rated boost) in full supercharger gear was measured at 630.8km/hr (392mph) at 6,705.6m (22,000ft) at an all-up weight of 7,257kg (16,000lb). This speed was confirmed by Boscombe Down, and was above estimate. Following minor fuselage damage, again due to tailwheel problems during overload tests, the prototype returned to Hatfield, the A & AEE tests being completed on other Mosquitoes. The prototype was then allocated to further aerodynamic trials, flying at high speed with the bomb doors open to observe flutter and then, on July 23, 1941, it was tested with the unpopular mock-up turret fitted and with its four guns facing in various directions. Although the handling was satisfactory, the expected speed penalty of 32km/hr (20mph) robbed the aircraft of its chief asset.


**One of the mock-up turrets fitted to the Mosquito, but discarded due to the loss of speed caused by the extra drag. Upward firing guns were used on German night fighters to great effect against RAF bomber formations, but were not used by the allies.**

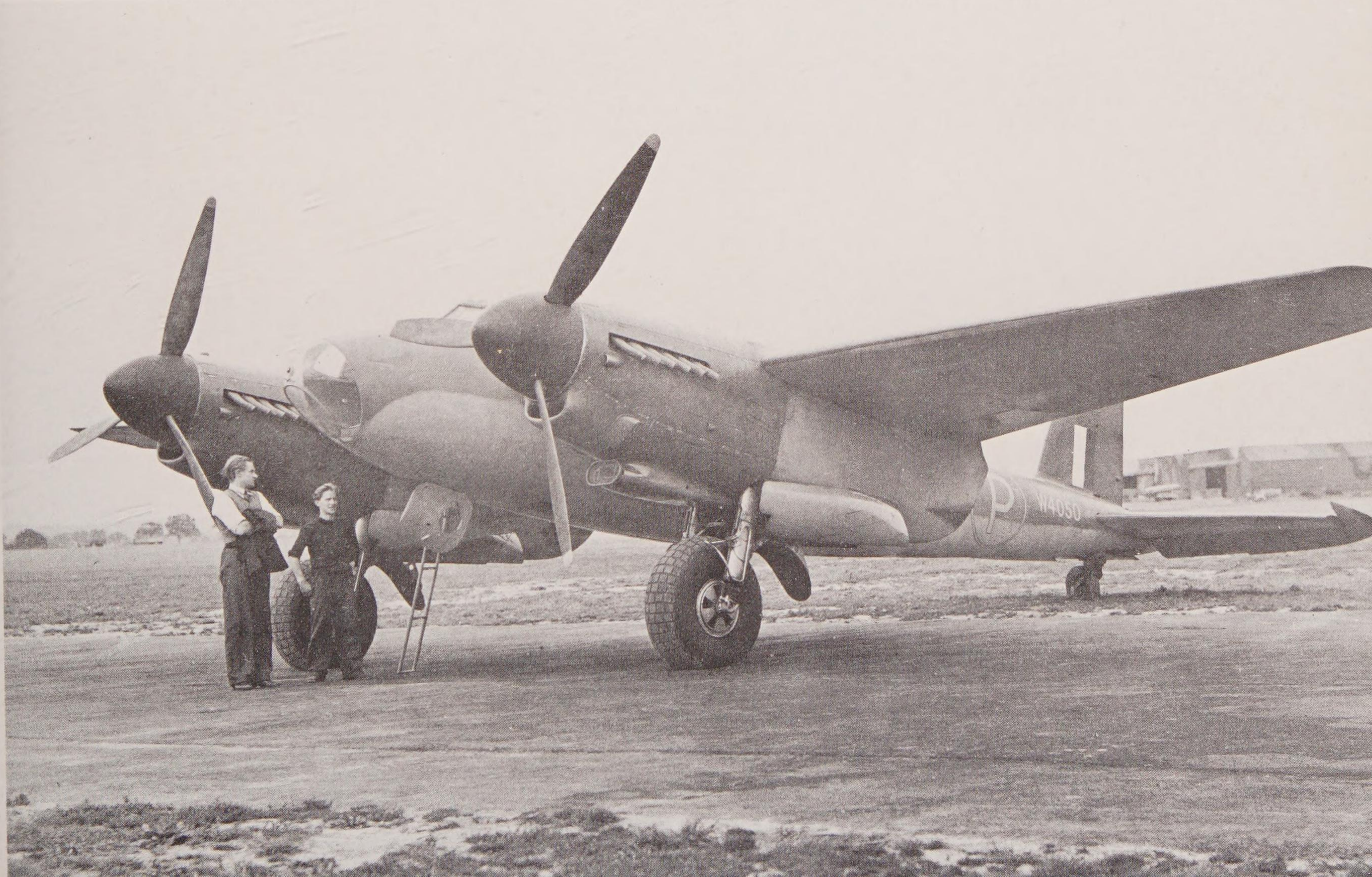
In addition to Geoffrey de Havilland Jnr, three other pilots were involved in the test programme: Pat Fillingham, George Gibbins and John de Havilland. John de Havilland was the youngest of the three sons of the founder, and both he and George Gibbins were killed with their two observers, G. J. Carter and J. H. F. Scrope, when they collided in mid-air in cloud during test flights in HX849 and 850 on August 23, 1943, the wreckage falling close to Hill End Hospital in St Albans. Pat Fillingham remained as a senior test pilot with the company, finally flying Trident airliners before his retirement.

In the Experimental Department at Hatfield the first full bomber prototype, W4057, was completed, originally having been started as a reconnaissance version. It flew during the third week of September 1941, and was delivered to Boscombe Down on the 27th, to be followed by the first production bomber, W4064, on October 18. Both were soon returned for trials to increase the Mosquito's bomb load, the plan being to carry four 227kg (500lb) bombs internally. Initially, this was tried by fitting the bombs with telescopic fins, which automatically extended when it was released. However, a simpler solution was to shorten the vanes on the bomb, and as this did not impair the ballistics, the shorter bomb was adopted as standard.

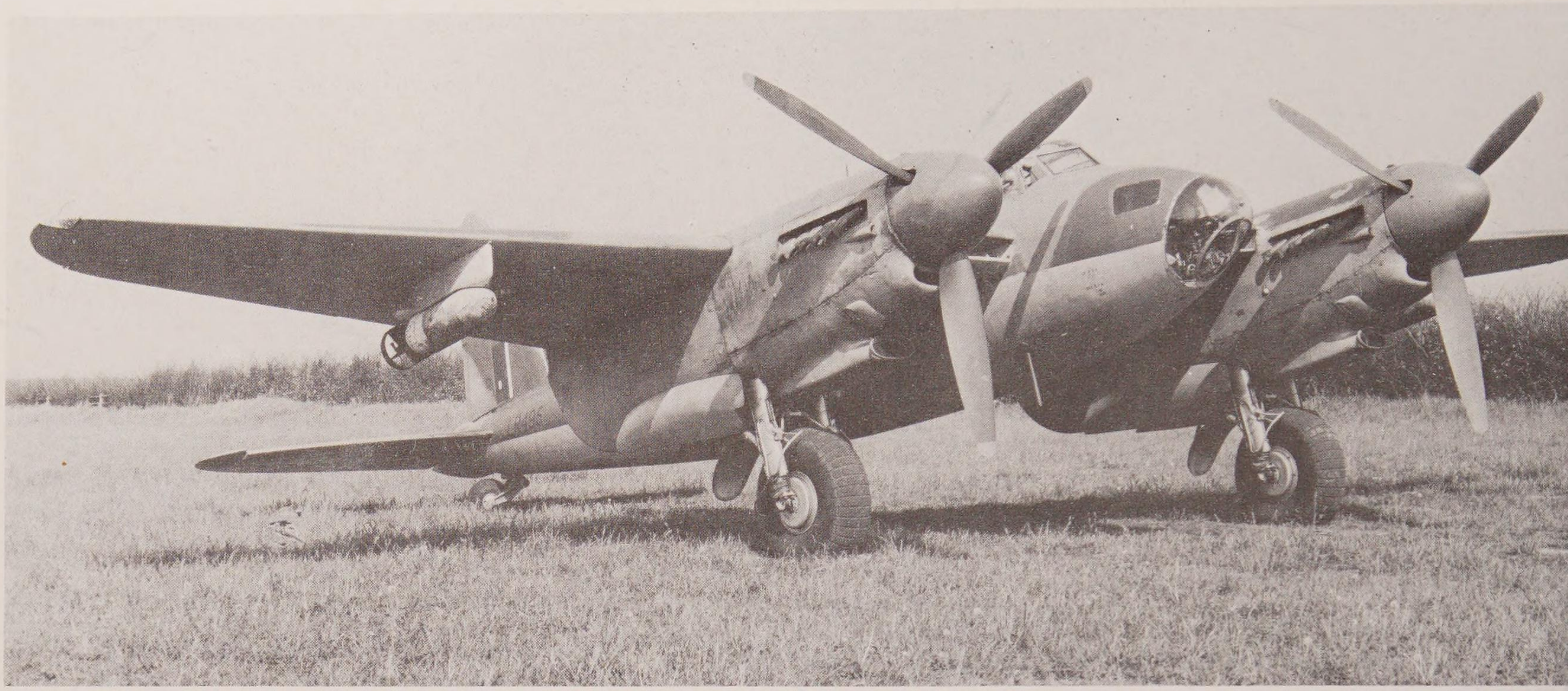


Early production Mosquito bomber W4072 with short engine nacelles. *IWM*

The prototype W4050 fitted with two-stage Merlin 61 engines, but with three blade propellers, the four bladers showing little advantage.

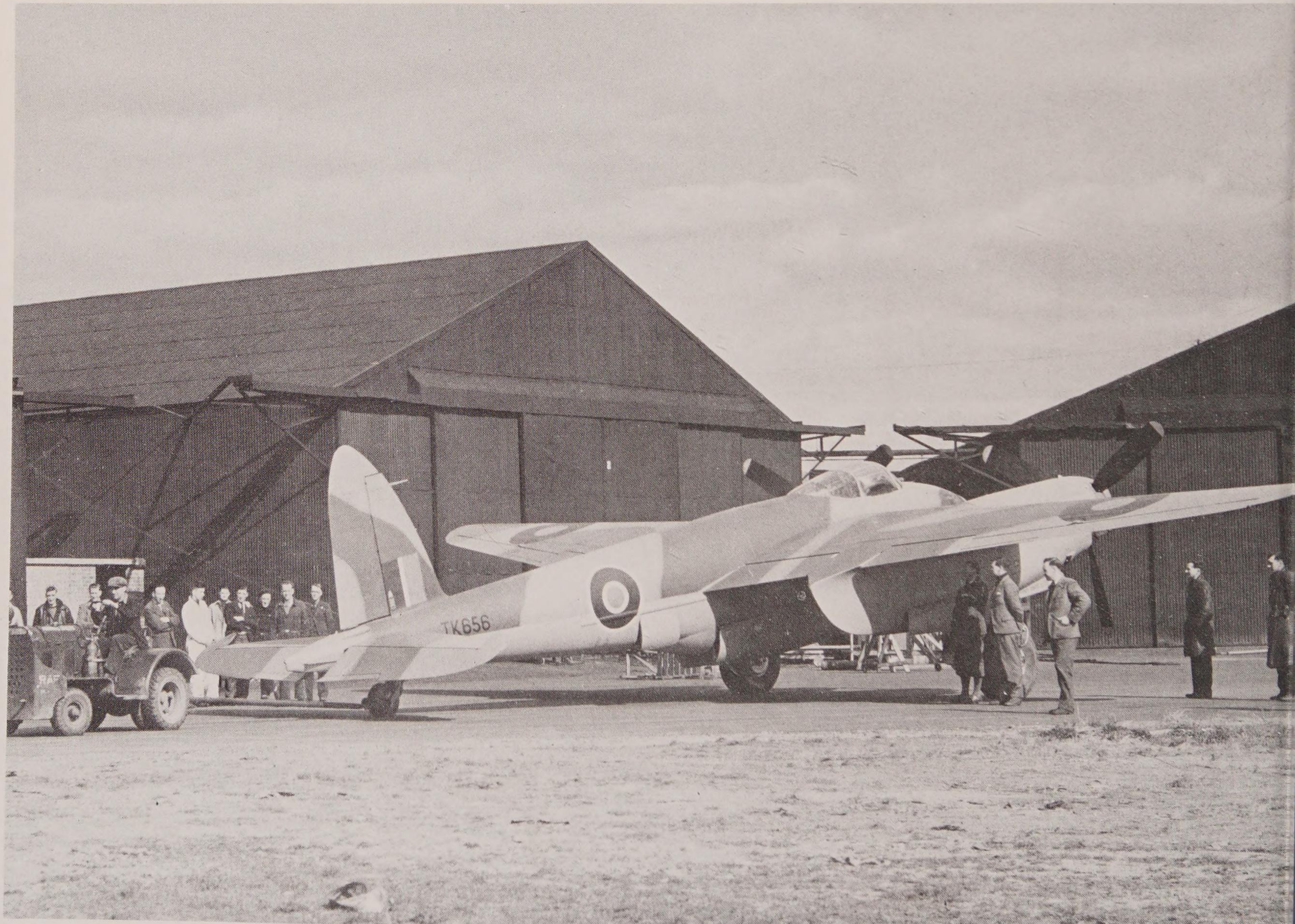


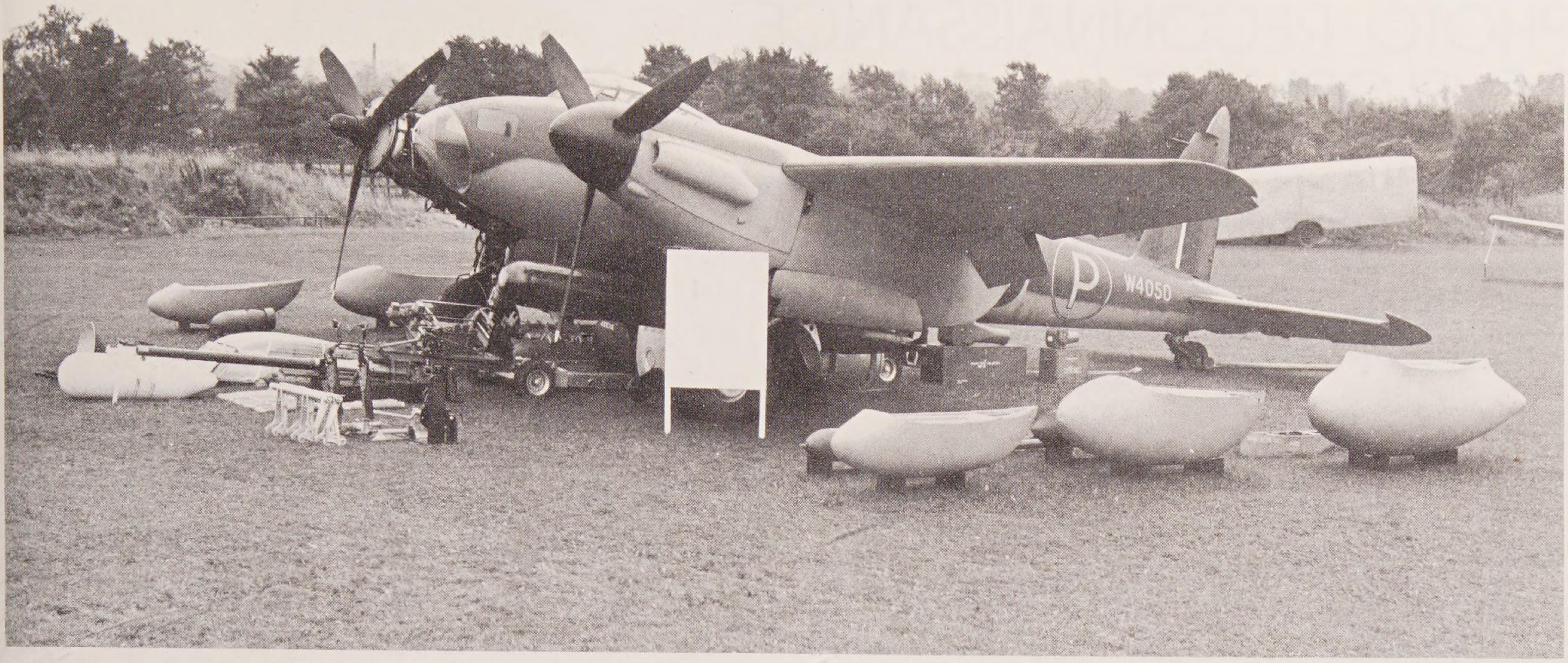
**The bulged bomb bay on the B.MkXVI gave sufficient space for a 4000lb bomb.** *Charles E. Brown*



The first Mosquito B.MkIX LR495 with one (227kg) 500lb bomb under each wing, as well as four carried internally. This aircraft first flew on March 24, 1943. *Crown Copyright*

The roll out of the last Hatfield built Mosquito, B.35 TK656 on April 10, 1946.





**Mosquito prototype W4050 at the SBAC show at Radlett on September 14, 1946, surrounded with some of the alternative loads.**

The development programme on the prototype, W4050, continued with the fitting of two-stage Merlin 61 engines. The wing was moved back to Salisbury Hall by road on October 31, when preparations for the installation commenced, but the first engine was not delivered until early the following February. On March 25 the wing was reassembled to the fuselage back at Hatfield, and four-bladed propellers were fitted for engine runs to start on June 17, 1942. The first flight was made three days later by Geoffrey de Havilland Jnr, and on its second flight, later the same day, an altitude of 12,192m (40,000ft) was attained, the highest to date.

It was planned to produce a pressurised high altitude fighter with the Merlin 61 engines, but W4050 was not representative, so a new airframe, MP469, was completed in July, initially as a pressure cabin bomber prototype, and made its first flight on August 8. The exploits of this aircraft will be covered in a later chapter. This high altitude version was also to have its wing span increased to 19.8m (65ft), but wing strength on the prototype would not allow extension beyond 18m (59ft 2in), the half-way stage. It was later returned to the original 15.9m (52ft 6in) and the Merlin 61s were replaced by Merlin 25s. This is the form in which it is preserved.

John de Havilland flew the prototype in the modified form, reaching an absolute ceiling of 11,521m (37,800ft), and in November 703km/hr (437mph) was reached, the highest speed ever attained by a Mosquito in level flight. The Mosquito remained the fastest aircraft in service on either side until the advent of the jets.

The development with the two-stage Merlin 61 resulted in the B.IX replacing the earlier B.IV on the production lines. The first MkIXs were introduced to the production line in early March 1943, LR495 making its first flight on March 24. Following initial company trials, the first aircraft went to Farnborough on April 4 and took off at 10,433kg (23,000lb), the highest weight yet flown. This was in preparation for the carriage of 4 x 227kg (500lb) bombs internally, a 227kg (500lb) bomb under each wing, 2,455lit (540gal) of fuel and 90.7kg (200lb) of desert equipment. This eventually led to the Mosquito carrying a single 18,144kg (4,000lb) bomb in a bulged bomb bay, first accomplished in the B.XVI. By the end of April the first MkIX had been delivered to 109 Squadron, to be followed by deliveries to 105 and 139 Squadrons.

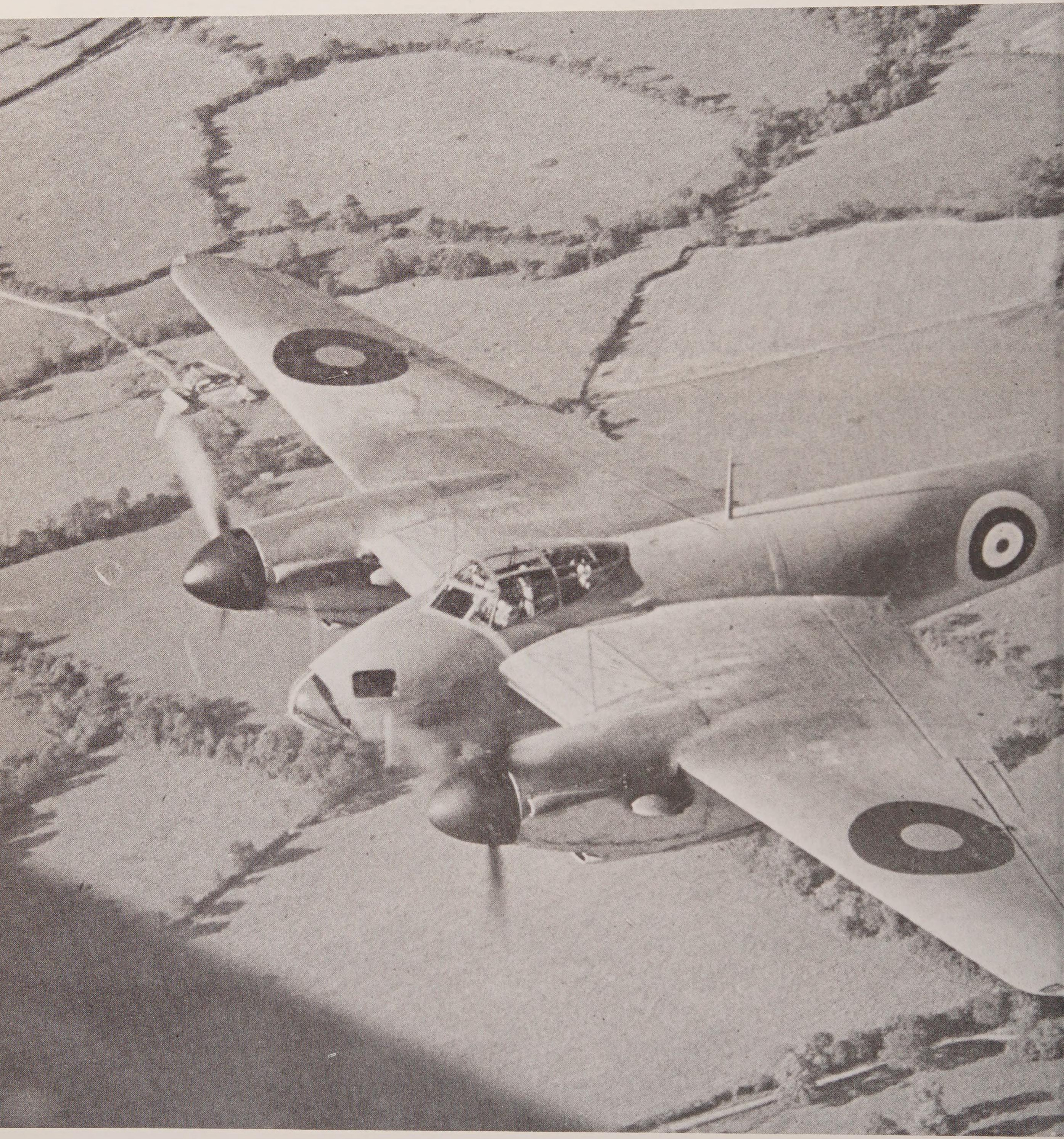
The B.XVI represented the final major development stage with the bomber, the pressure cabin having been added to the MkIX. Design work commenced in April 1943, and in late July DZ540, converted from a MkIV, flew as the pressure cabin production prototype. With an altitude of 12,192m (40,000ft) being reached, the MkXVI entered service as a bomber and photographic reconnaissance aircraft. The first B.XVI, ML926, was rolled out in October 1943, with production deliveries commencing in December to 109 Squadron. The first 12 aircraft had the standard bomb-bay, but subsequent aircraft had the bulged bomb bay to accommodate the 1,814kg (4,000lb) "cookie". The first of these aircraft, ML937, was flown by Geoffrey de Havilland on January 1, 1944, and delivered to Boscombe Down on February 5. Some MkIXs also had the bulged bomb bay fitted, ML915 being the first such conversion. Its tare weight was 6,642kg (14,644lb), the tare weight of the MkXVI being 6,758kg (14,901lb).

The final bomber version was the B.35, first flown on March 12, 1945. It differed mainly in having Merlin 113/114 engines which gave it a top speed of 679km/hr (422mph) at 9,144m (30,000ft). However, the B.35 came too late to see operational service, although 57 had been delivered by the end of May. They served as pathfinders with 109 and 139 Squadrons first, at Coningsby and then at Hemswell, until replaced by Canberras in 1952 and 1953.

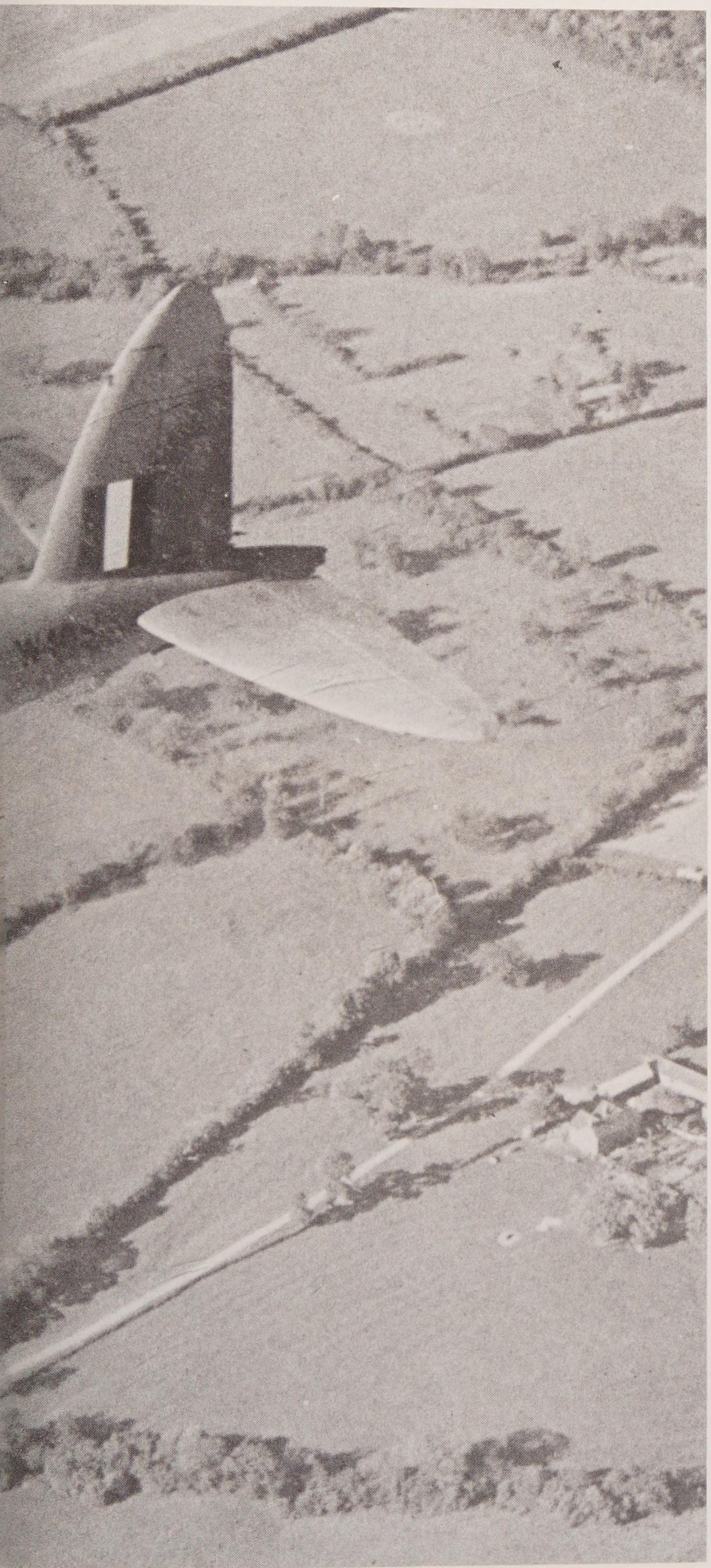
In the early 1950s a number of the Mk35s were converted to TT.35s by Airspeed at Portsmouth, with and without a target towing winch fitted externally. The only major external change to the Mosquito came with the TT.39 which had a lengthened and glazed nose, a number being converted by General Aircraft at Hanworth for service with the Royal Navy. Few saw service, though many were either converted or earmarked for conversion.

Meanwhile, the prototype had almost completed its flying programme, including some exhaust stack development work at Rolls-Royce from March 1 until June 10, 1943. It was subsequently used by the apprentices for ground instruction at Hatfield, and displayed statically at the Society of British Aircraft Constructors displays at Radlett in 1946 and 1947, surrounded by typical warloads and variations in fittings. It was then put in store at Chester and Hatfield and was finally rescued from destruction in early 1959, when it was returned to its birthplace at Salisbury Hall. It was the first aircraft in what was to become the Mosquito Aircraft Museum, its only non-original items being a pair of new propellers, as the earlier ones could not be traced.

# PHOTO-RECONNAISSANCE DEVELOPMENT



**The PR prototype Mosquito W4051, built at Salisbury Hall and moved to Hatfield by road.**



From the initial batch of 50 aircraft ordered to Specification B.1/40 under contract No 69990 on March 1, 1940, a PR prototype and 19 PR production aircraft were required. In general, these aircraft were very similar to the bombers and in many cases were allocated the same mark numbers, but were loaded with cameras and painted PR blue. Like the first prototype, the prototype PR version, W4051, was also built at Salisbury Hall and moved to Hatfield by road. Assembly was completed on May 24, 1941, the same day as the first production PR.I, W4054, went into the paint shop. Minor delays had been caused by the scrapping of seven sets of fabric-covered ailerons and replacing them by metal-skinned units. W4051 flew on June 10, and two days later it was flown by Wg Cdr G. Tuttle of the Photo-Reconnaissance Unit (PRU) at Benson, who were eager to get the aircraft into service. On June 25 the prototype arrived at Boscombe Down for its service trials.

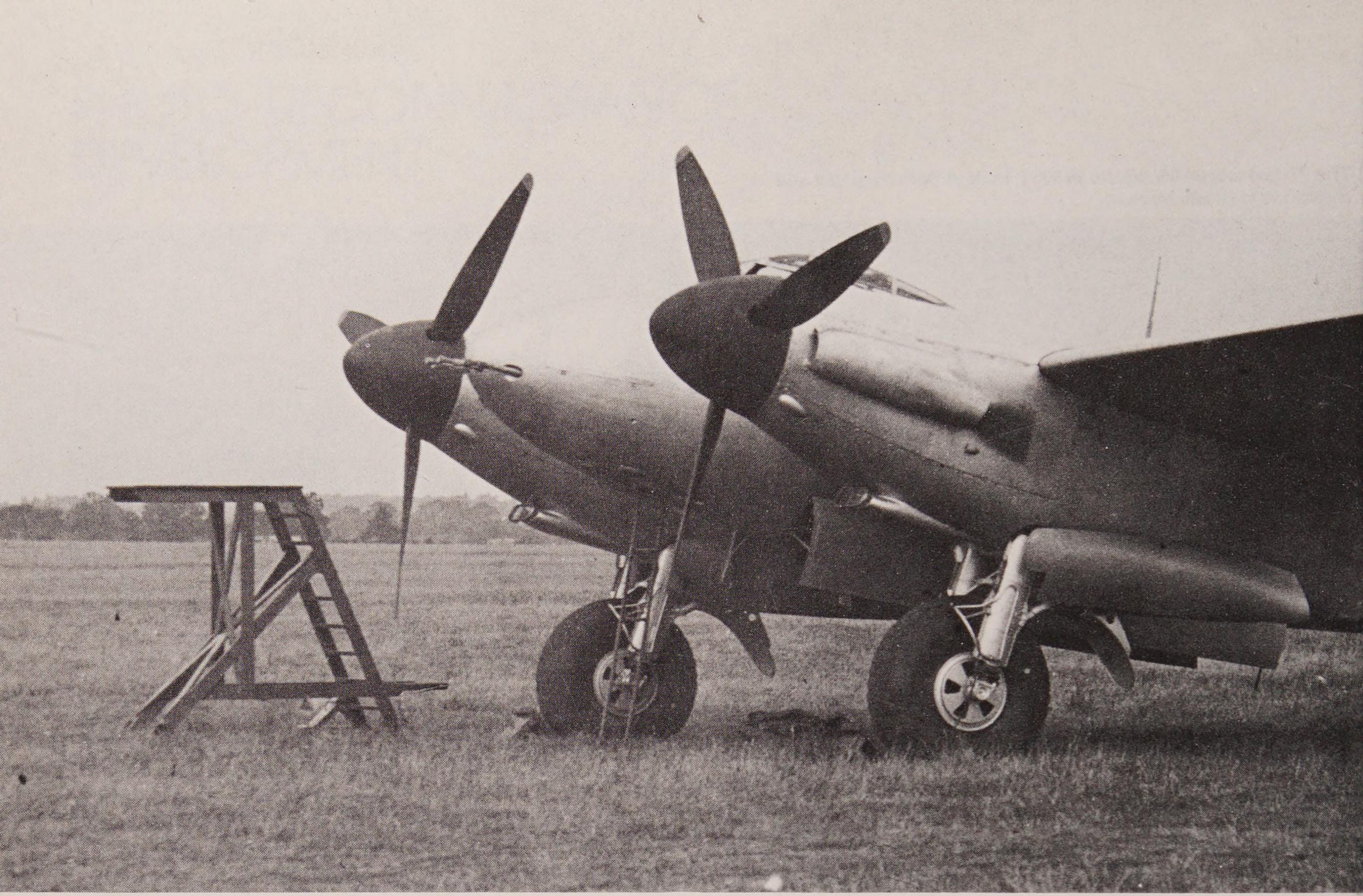
During the summer of 1941, using the prototype and first production aircraft, camera installations were checked and performance parameters were measured. By mid-September the PRU had five PR.Is in service and a sixth was on flight test.

Endurance was improved by the addition of 3,182lit (700gal) of fuel, the first of these long-range PR.Is, W4060, flying in September 1941 and being delivered to Boscombe by the end of the month. PR operations commenced from Benson with W4055 on September 17 and met with great success, but the demand for the Mosquito in other tasks was so great that it was difficult to obtain enough aircraft. The first ten were in operation, but the second batch of ten was completed as bombers, and the remainder of the 50 aircraft on order were already allocated to fighter production. Additional aircraft were obtained by allocating two F.IIs then being fitted with Airborne Interception (AI) radar at the Maintenance Units (MUs), and two B.IVs which were allocated from the production line after a visit to Hatfield. All four had cameras fitted.

The PR.Is served well, but for the deeper European penetrations better performance was required to counter the Focke-Wulf FW190 threat, so the PR.IV was modified by the installation of two-stage Merlins as fitted to the prototype W4050. This resulted in the PR.VIII, one of the two occasions when the development of the PR type was not parallel with the bomber version. Five PR.VIIIs were eventually ordered, carrying 2 x 227lit (50gal) drop tanks, and 26 PR.IVs were converted from bombers by fitting similar drop tanks and Merlin XXIs. The two-stage Merlins gave the Mosquito an improved, high altitude performance, and greater comfort was promised by the pressure cabin to follow. In the interim the PR.IX was produced, 90 of which were built and delivered from Hatfield from May to November 1943. The first PR.IX flew at the end of April 1943 and was powered by the more powerful Merlin 72/73 engines with 18lb maximum boost and extra internal fuel tankage, increasing the range to over 2,414km (1,500 miles).

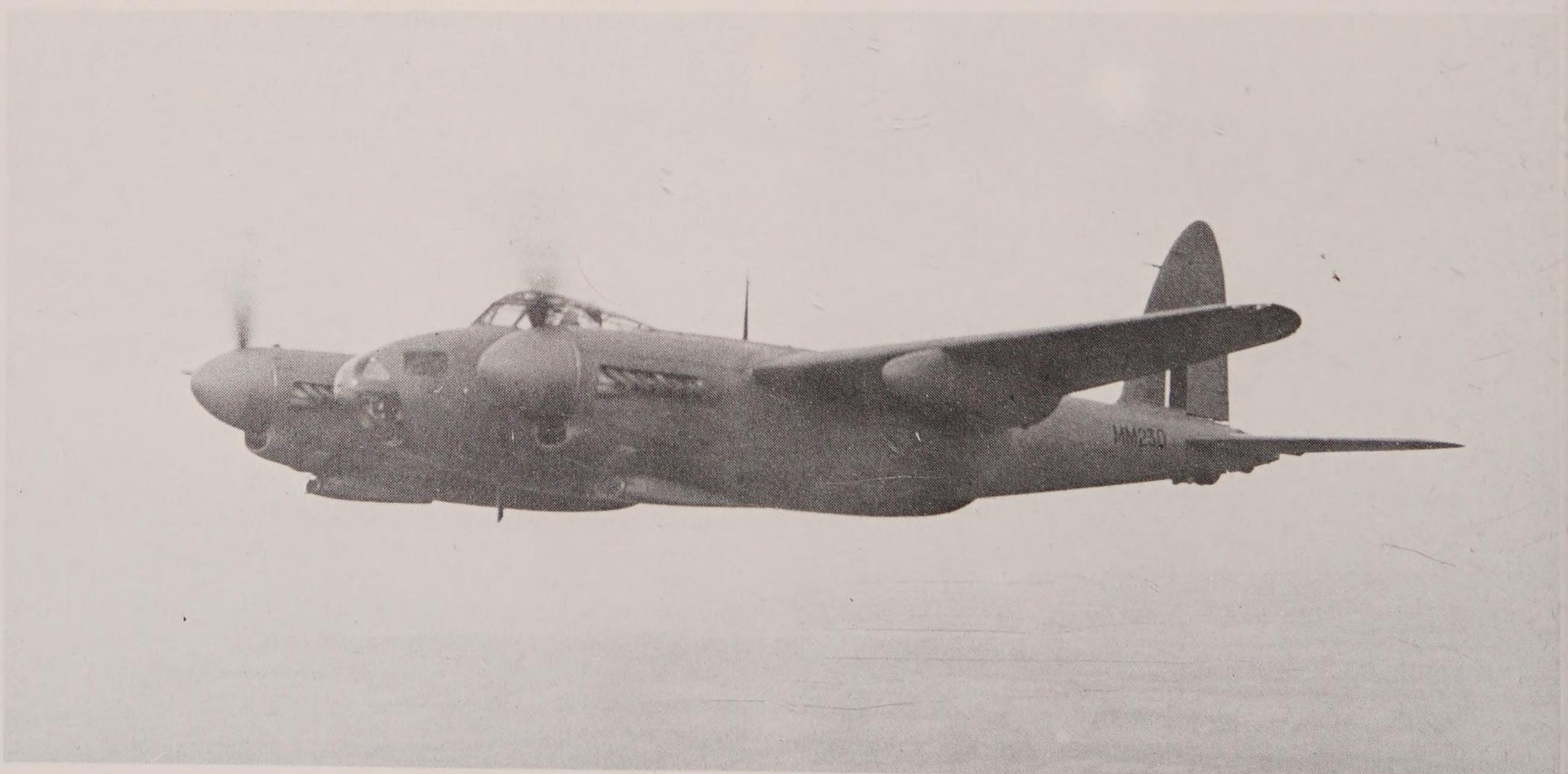
The pressure cabin version of the MkIX was authorised from April 3, 1943, the reconnaissance version taking priority over the bomber. With a pressure cabin based on that of the MkXV, the prototype PR.XVI, DZ540, flew in July 1943 and reached 12,192m (40,000ft). Production deliveries began in November, but problems with misting of the sandwich windscreen delayed operations until the following February, when they commenced in a big way.

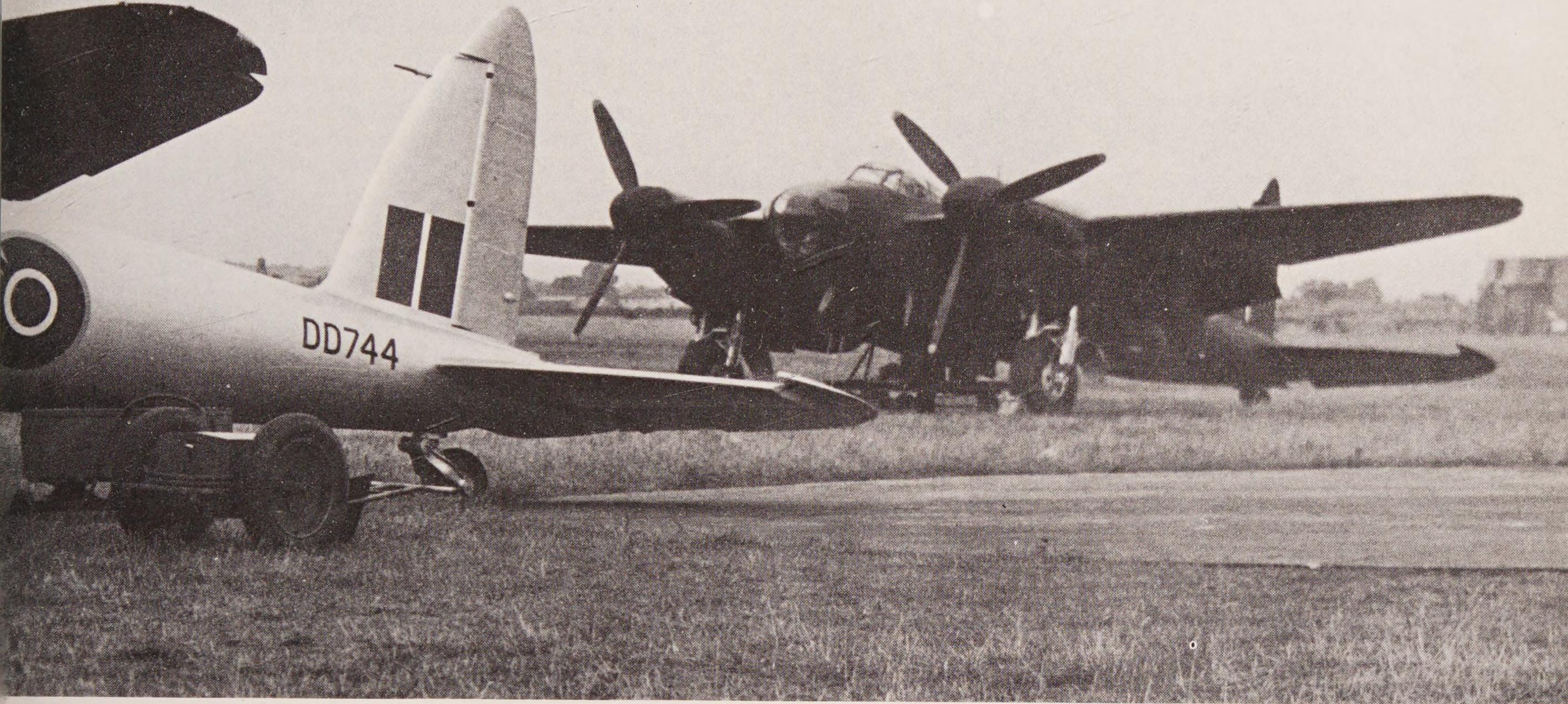
The next development was the second to have no parallel bomber version. This was the PR.32, which was lightened and had extended wing tips for operations around 12,192m (40,000ft) to evade the enemy jet and rocket fighters. Only five were built, serving during



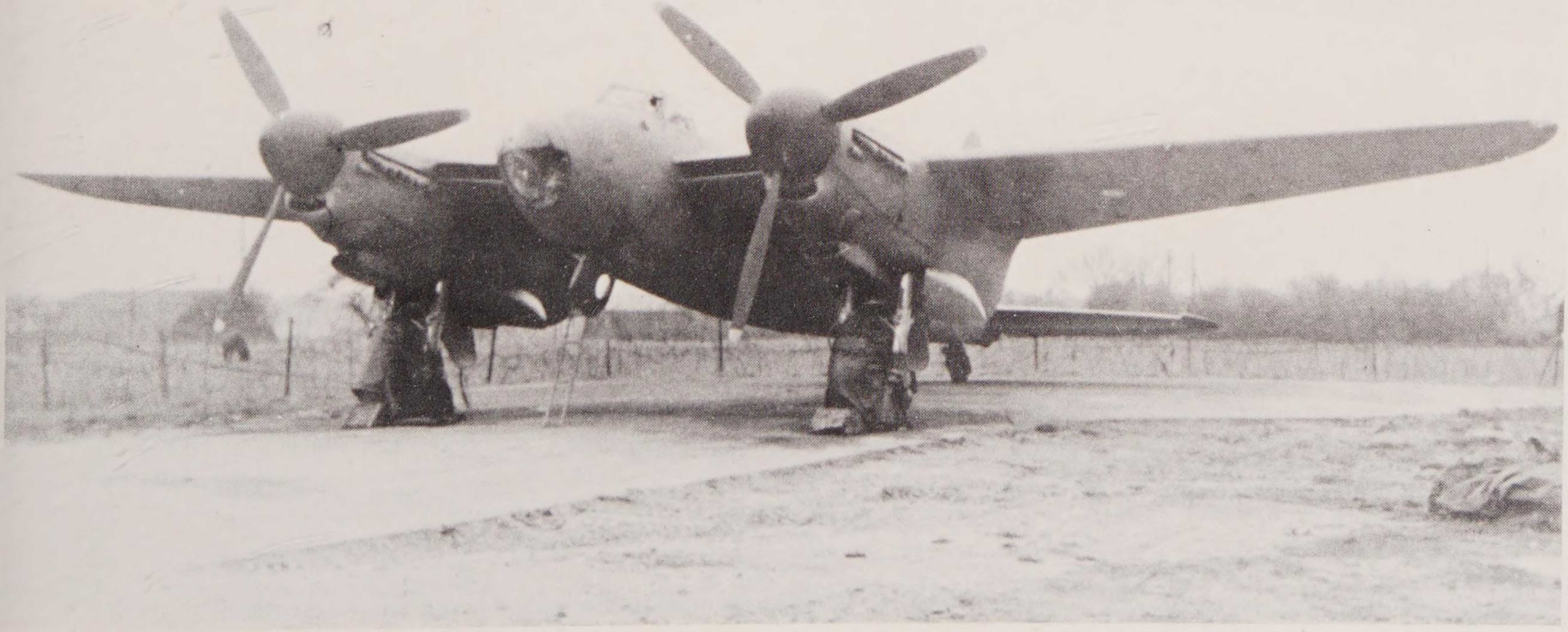
Mosquito PR.MkII DD744 later to join No. 60 Squadron SAAF.

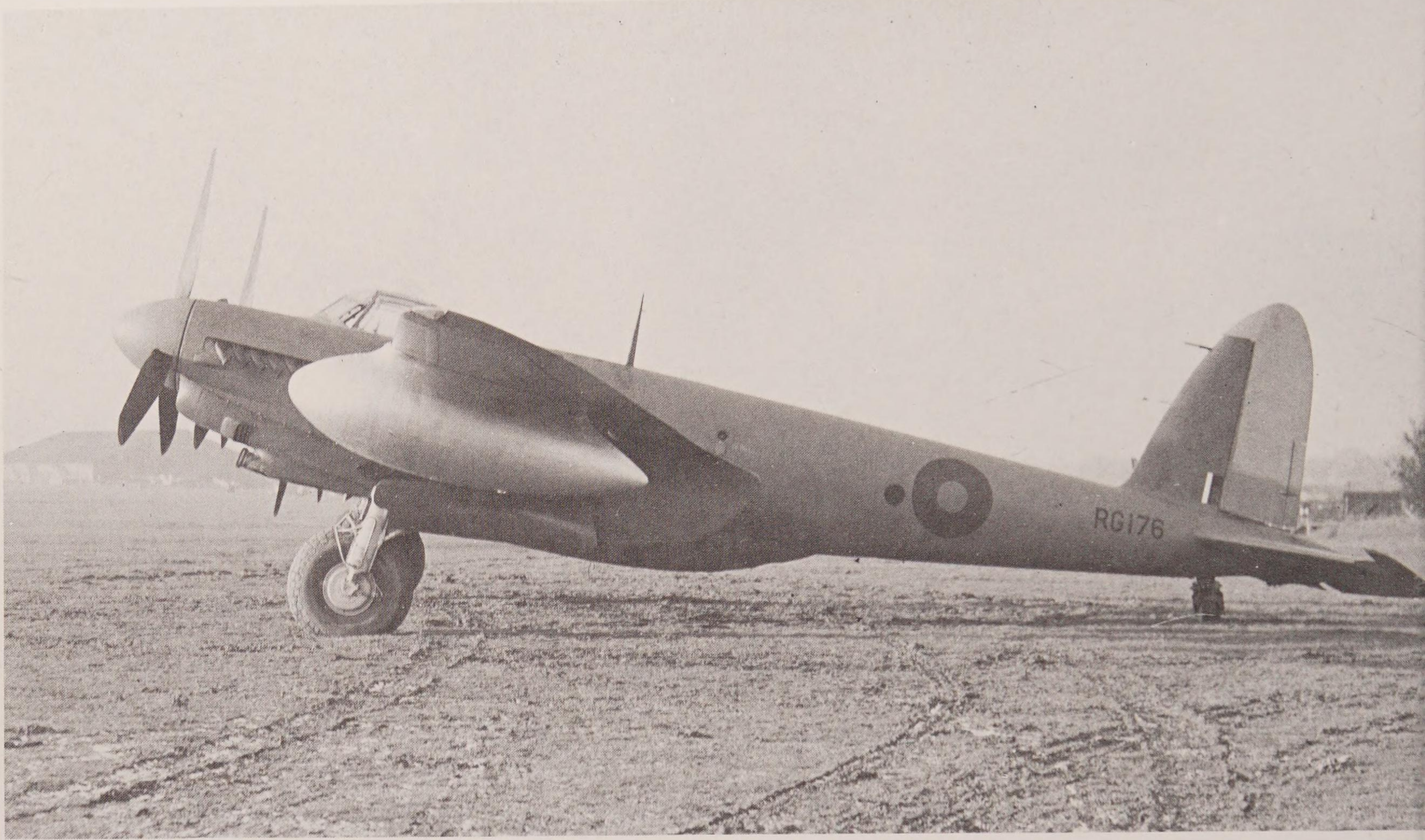
The Two-stage Merlin 61 powered Mosquito PR.IX MM230.





**Pressure cabin Mosquito PR.XVI MM273 with No. 4 Squadron at Gatwick in 1944.** *Mr. F. Andrews*





**Mosquito PR.34A RG176 with the addition of two 200 gallon underwing drop tanks.**

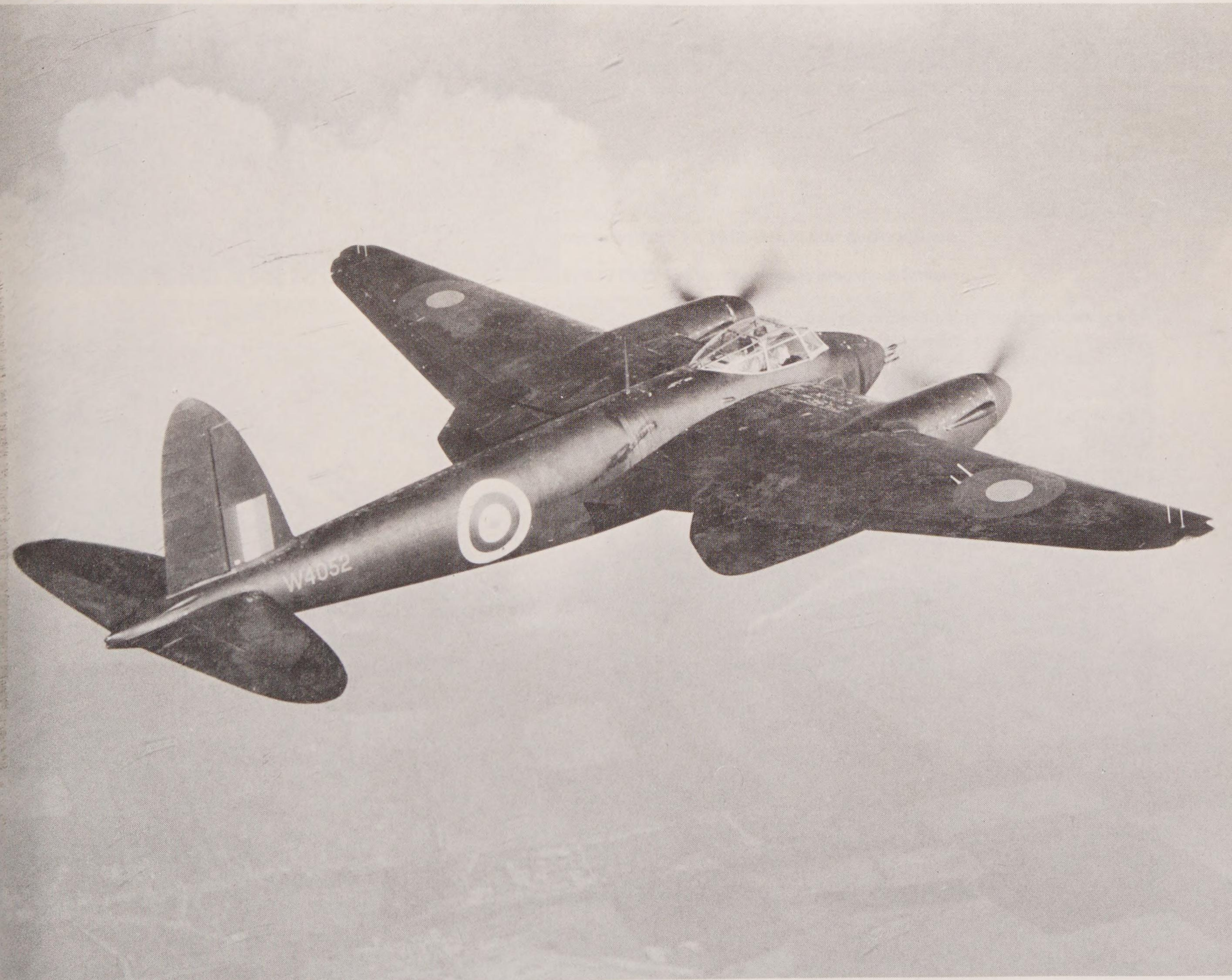
the final stages of the European war. The ultimate photo reconnaissance Mosquito was the PR.34, similar to the B.35, with its bulged bomb bay full of fuel tanks which gave it ultra-long range. The wing drop tanks were increased to 454 or 909lit (100 or 200gal) capacity, making a total of 5,737lit (1,262gal) and giving a range of 5,793.6km (3,600 miles) at 7,620m (25,000ft) with true airspeed of 482km/hr (300mph). The handling of the aircraft at these weights was somewhat less pleasant than the lighter-loaded PR.I, but all-up weight had increased from 8,805kg (19,413lb) to 11,567kg (25,500lb).

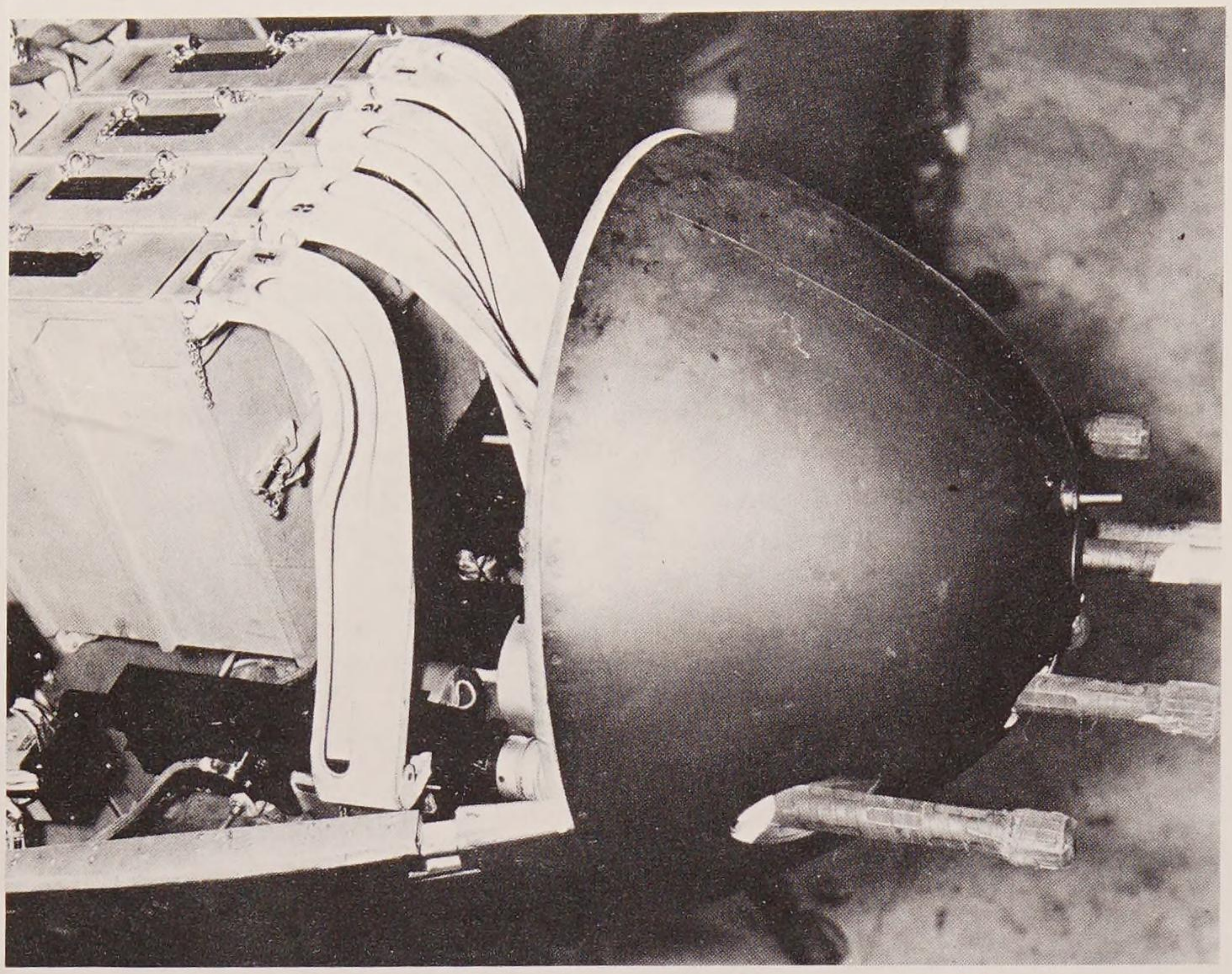
# FIGHTER DEVELOPMENT

The original contract 69990 had called for one bomber prototype and 49 production bombers, but on July 18, 1940, de Havillands were instructed to finish one aircraft as a fighter prototype, the third airframe, W4052, being allocated at Salisbury Hall. Although the bomber and fighter Mosquitoes look similar at first glance, the fighter differed significantly in fuselage detail. The crew looked through a flat, bullet-proof windscreen instead of a more streamlined split vee; the solid nose housed four .303 machine guns in front of a bullet-proof bulkhead, and four 20mm cannon were installed under the cockpit floor. Contract 135522 to cover the initial fighter order was issued on November 16, 1940, the need for an effective night fighter and a long-range fighter to protect our shipping from the predatory Focke-Wulf Condors being particularly urgent. Specification F.18/40 was issued to cover this requirement, and the Mosquito was the ideal response. However, turreted versions with the machine guns moved from the nose and an additional crew member were still being considered. Although the extra weight was not too serious a problem, the 8 per cent loss in endurance and range, together with a sacrifice of at least 16km/hr (10mph) in speed were critical.

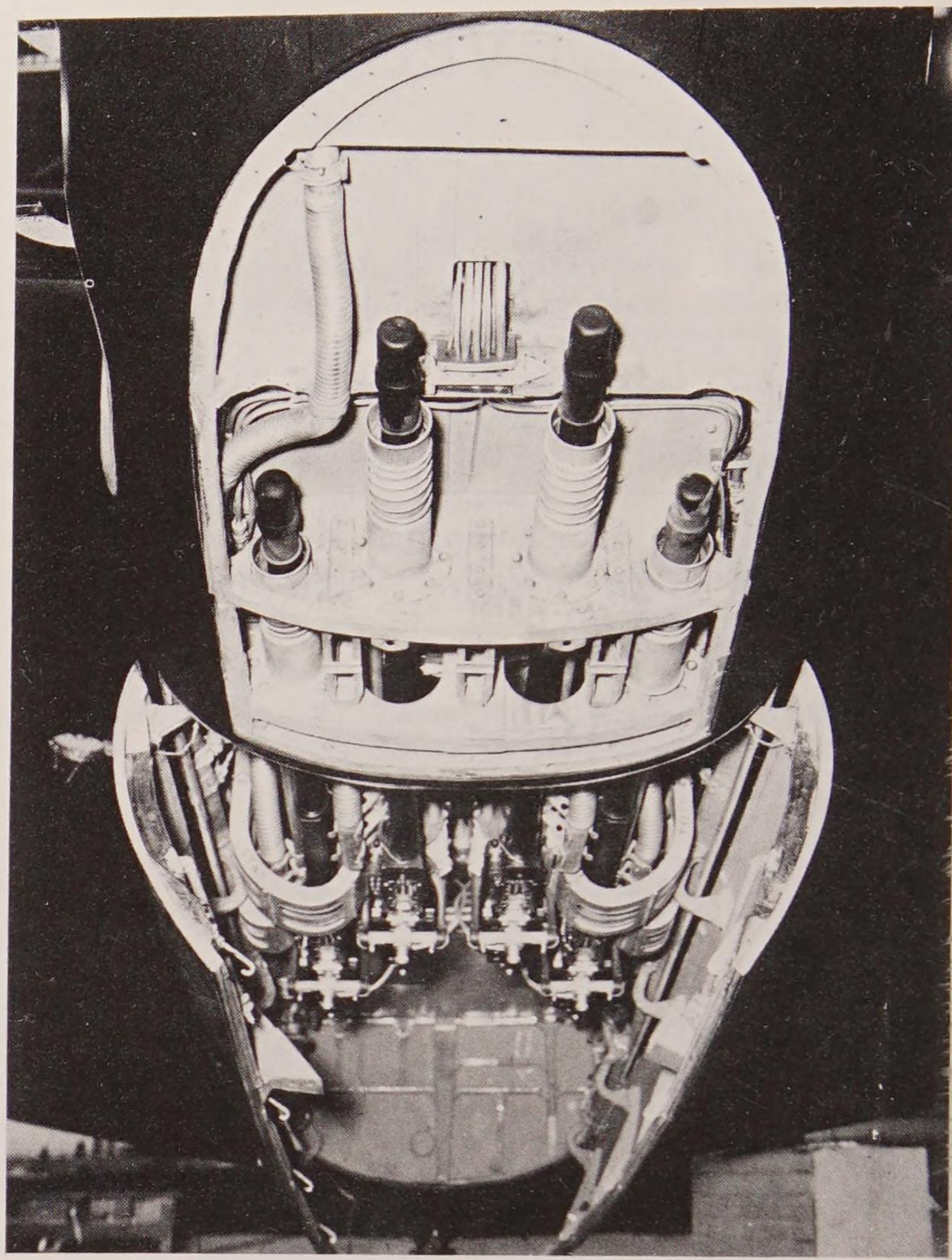
In mid-January 1941, the company was instructed to convert 28

**The NF.MkII prototype W4052 in overall black finish, which first flew from a field next to Salisbury Hall on May 15, 1941.** *Crown Copyright*



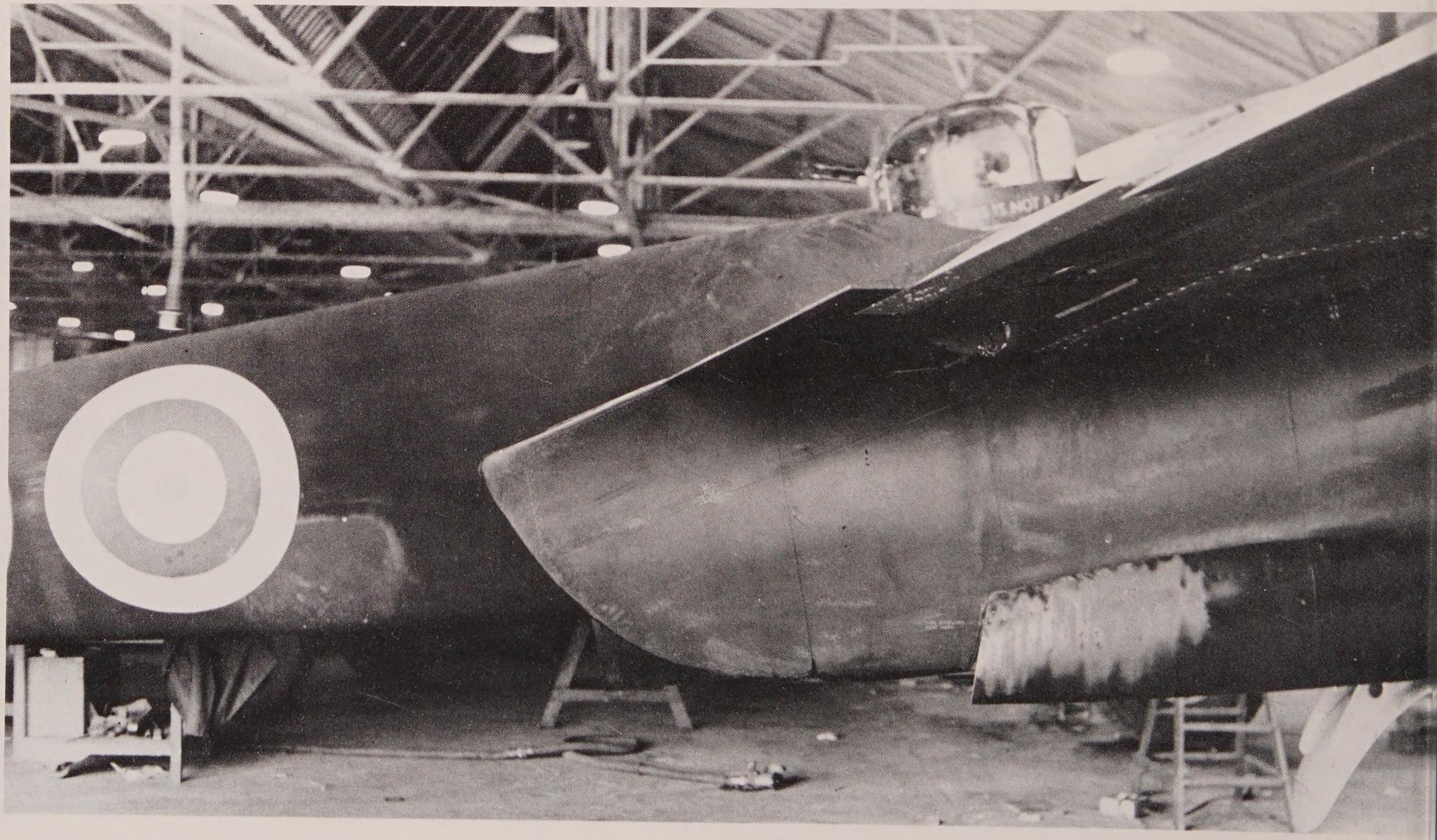


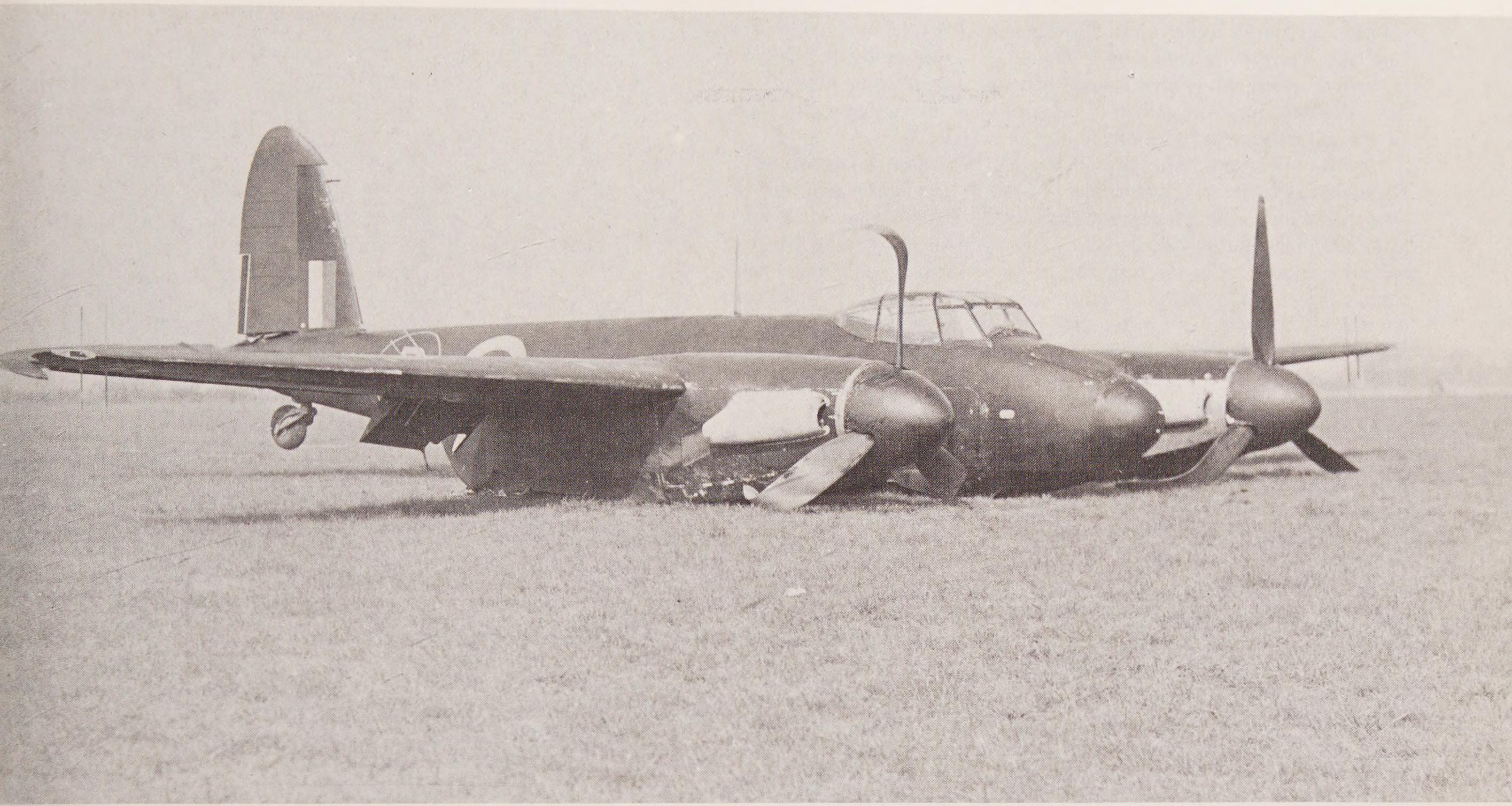
The nose mounted machine-guns with the ammunition boxes and feed chutes.



The 4 x 20–mm cannon installation under the cockpit floor and into the bomb bay.

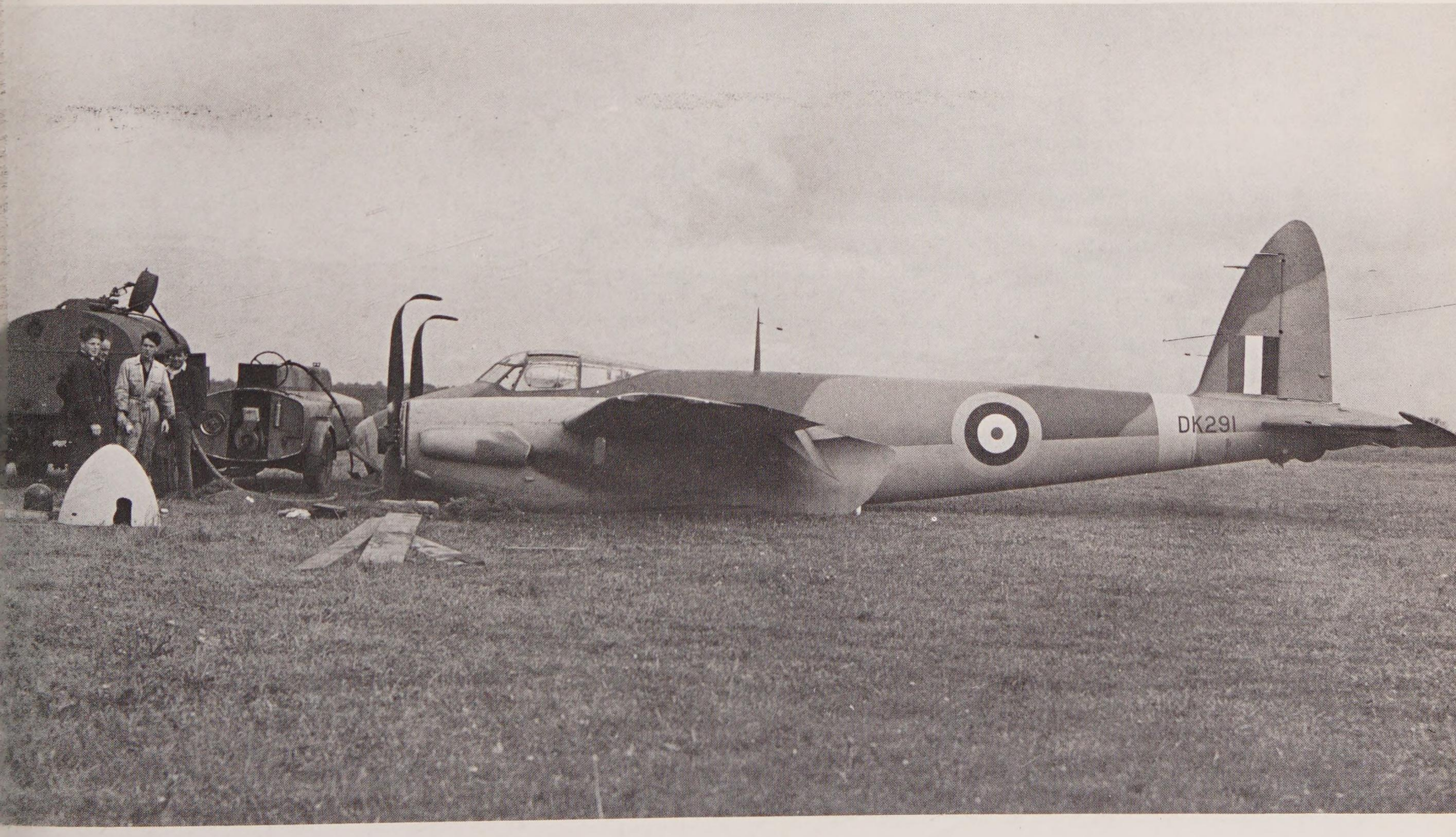
An experimental turret installation in the fighter Mosquito.





The fighter prototype W4052 following its forced landing at Panshanger on April 19, 1942, due to port engine failure.

Belly landing at Hatfield on May 29, 1942 by Geoffrey de Havilland in B.IV DK291 when the wheels would not lower.

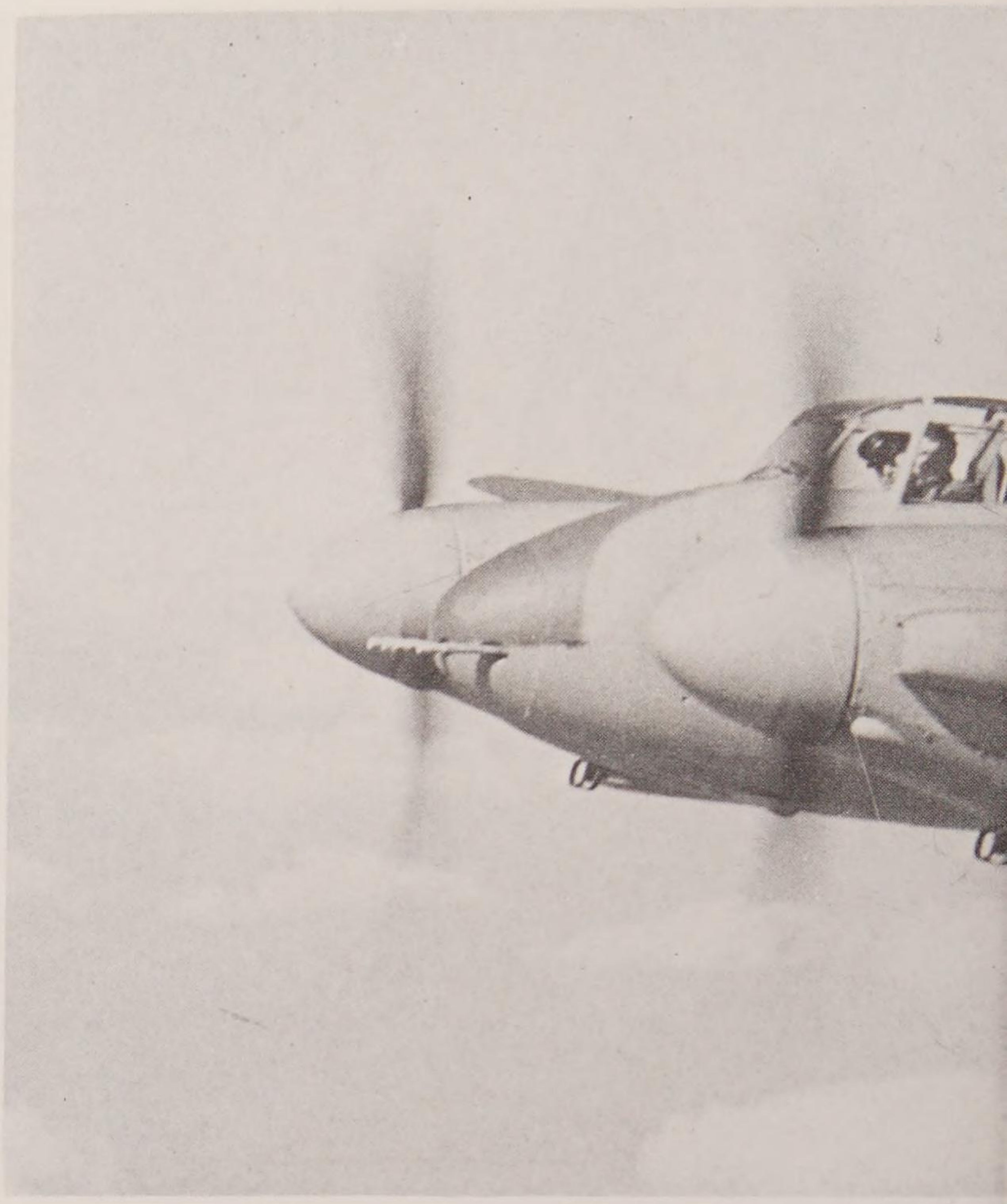


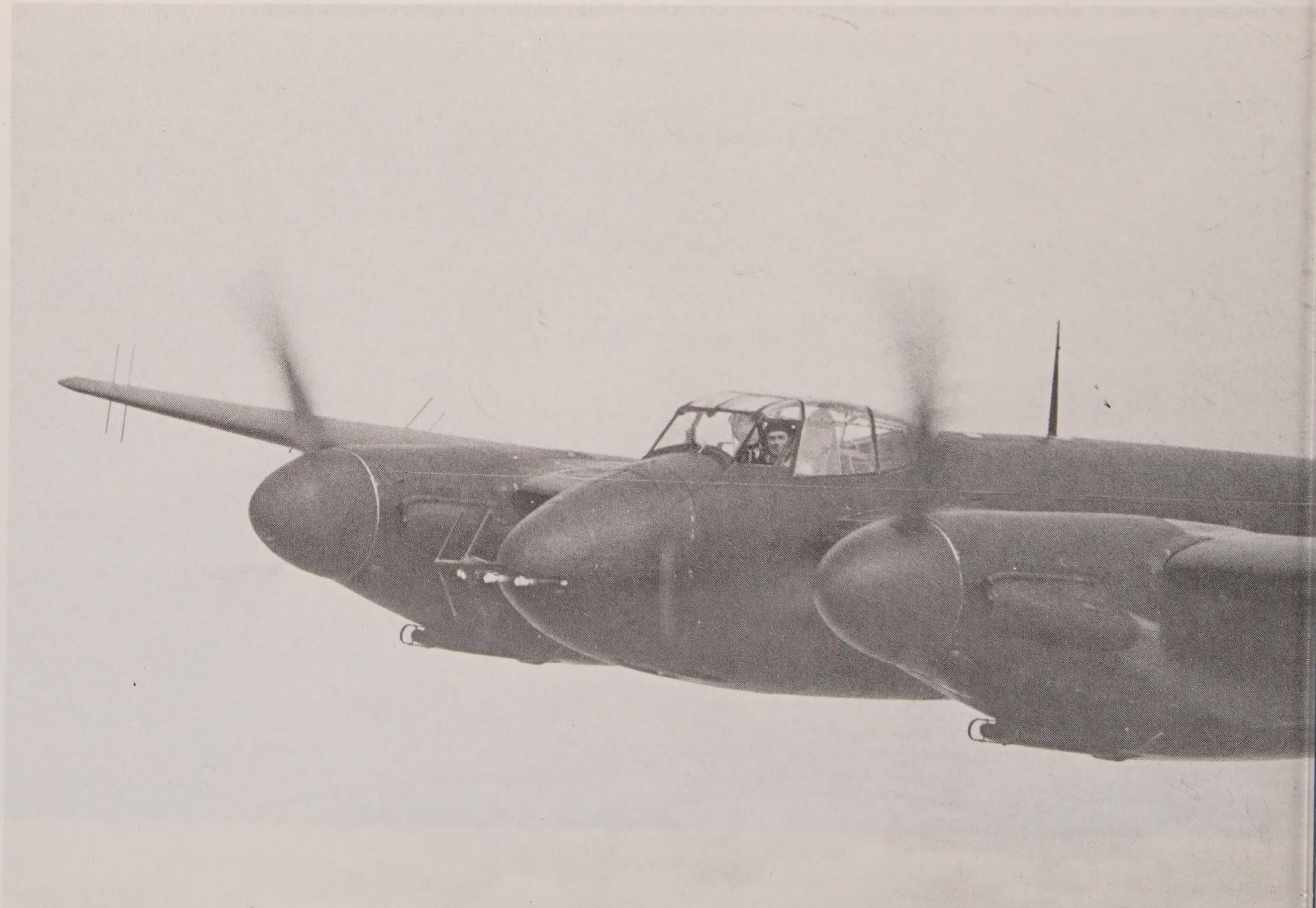
bomber airframes to fixed gun fighters in addition to the prototype, but two were to be completed with a four-cannon Bristol turret mounted on the top of the fuselage over the wing trailing edge. The 4th (W4053) and 24th (W4073) Mosquitoes were allocated to the turret programme at Salisbury Hall.

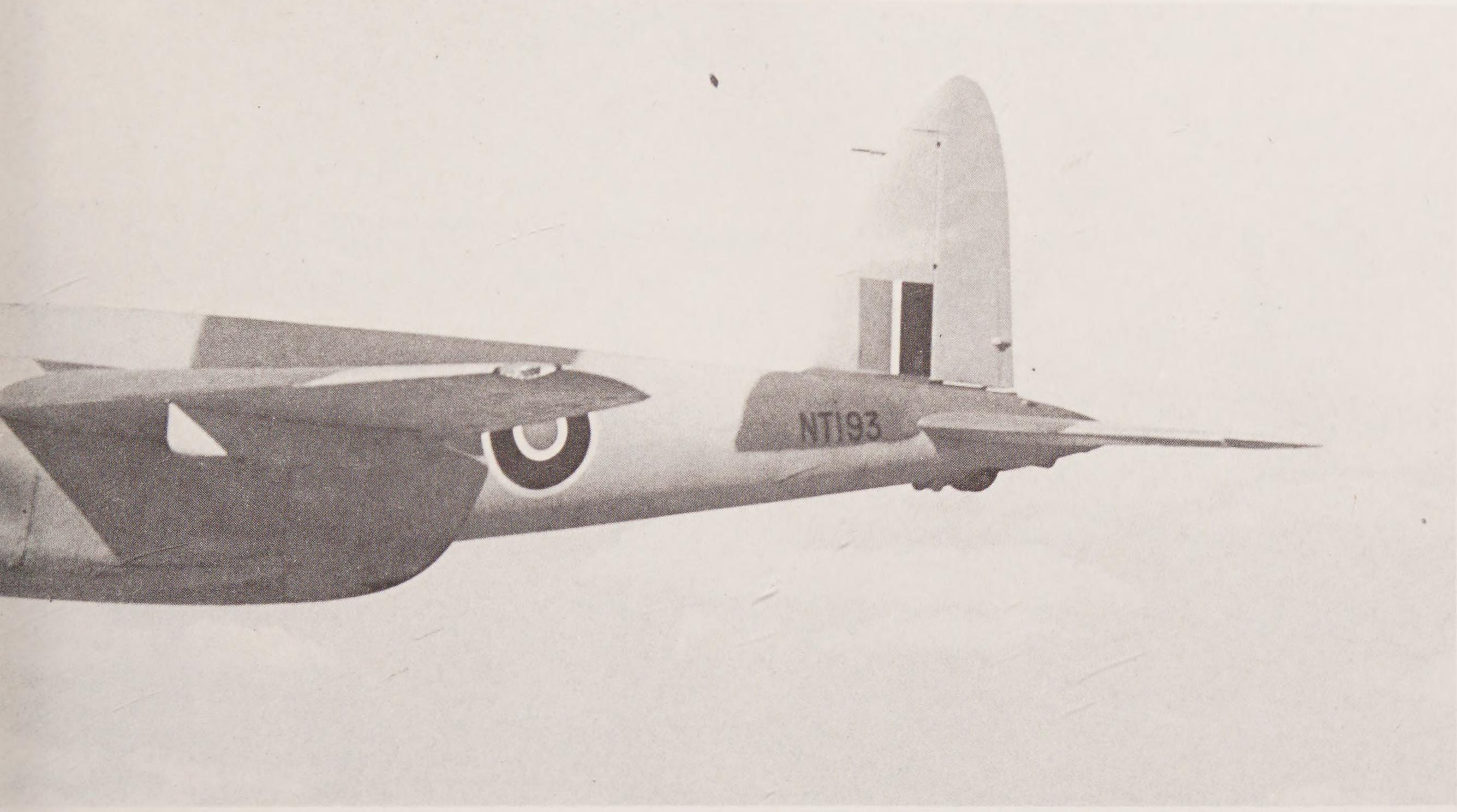
On the evening of Thursday, May 15, 1941, the day that Karl Richter was taken to Hatfield Police Station, the fighter prototype was rolled out of its hangar at Salisbury Hall and flown out of an adjoining 411.4m (450 yard) field by Geoffrey de Havilland Jnr to save one month's dismantling and re-assembly if it was moved by road. The lightly-loaded aircraft was rigged one wing low to counteract the engine torque and the workshop manager. Fred Plumb, was a passenger, having bet Geoffrey £1 that he would not fly the aircraft out.

The first turret fighter, W4053, was moved into the final assembly stage at Salisbury Hall, and the fighter prototype arrived at Boscombe Down on June 23 for its Service trials, only few snags being found. On return to Hatfield at the end of July, AI radar was fitted ready for first airborne tests against a target Blenheim on September 5.

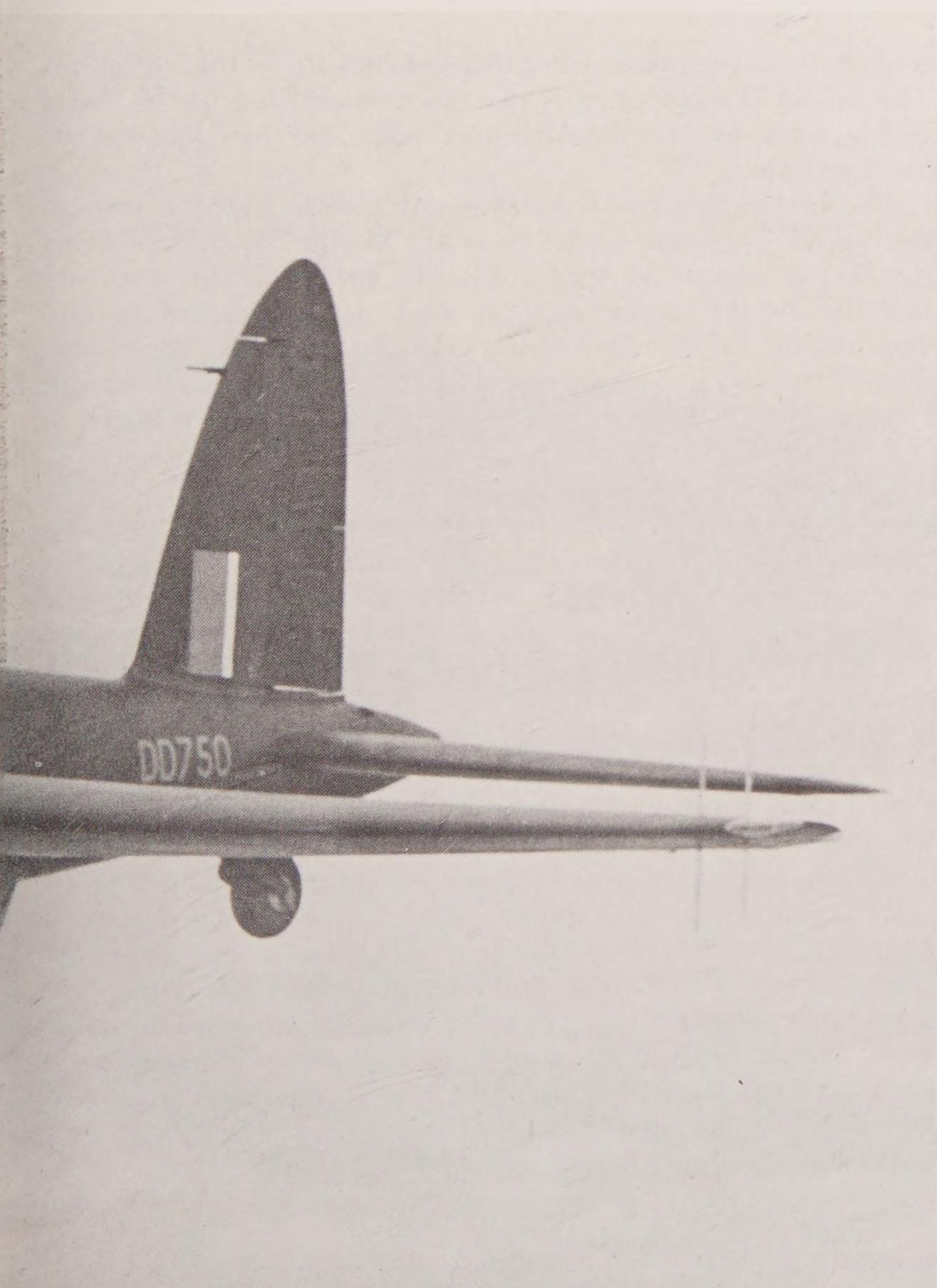
On September 14 the first turret fighter was flown out of Salisbury Hall, but by the time it landed at Hatfield, pieces of turret had been lost. The second turret fighter, W4073, the last Mosquito to be completed at Salisbury Hall, was fitted with a mock-up turret and flown out of Salisbury Hall by George Gibbins on December 5, 1941. However, this mock-up was soon removed and the turret tests ceased, as the fixed guns were effective provided suitable deceleration could be achieved when approaching an enemy raider. One method tried was a Youngman frill brake round the rear fuselage, which was tried in many forms from January 1 to August 1, 1942.







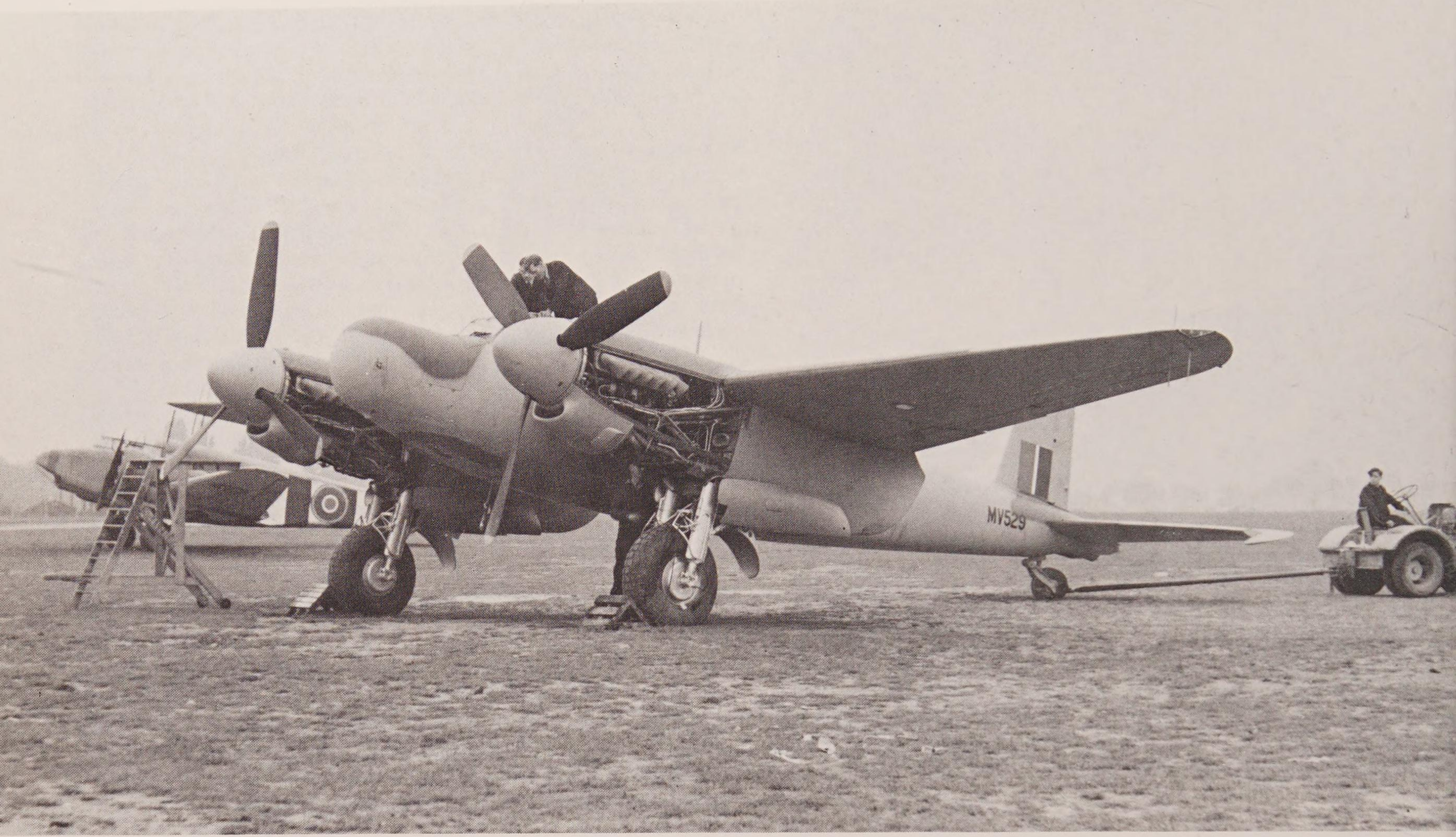
**Mosquito FB.VI NT193 on a pre-delivery test flight.**



**Production Mosquito NF.II DD750 during a production test flight.**
*Charles E. Brown*

The main problems in the Mosquito development programme were the tailplane flutter, particularly with the original short engine nacelles of the early PR Mosquitoes, the exhaust system, and the Saxophone flame shroud exhaust fitted to the night fighter. A matt lamp-black camouflage originally applied to the night fighters increased drag by 20 per cent, reducing the top speed by 42km/hr (26mph), so eventually a normal day fighter camouflage was adopted. New cowlings were fitted to carry the weight of the night-fighter shroud, W4052 being allocated to this and other general development flying with other Mosquitoes. However, there was an interruption on Sunday April 19, 1942, when Geoffrey had to feather a vibrating port engine at 6,096m (20,000ft) over Bedford. Although the Mosquito handled excellently with both engines running, there was less margin for error on one. Once on the approach, the pilot was committed to land, but on this occasion Geoffrey was baulked by a Percival Proctor taking off from Hatfield. He crabbed across Welwyn Garden City on the starboard engine, on which he was unable to increase power, waiting for the undercarriage and flaps to retract to reduce the high drag, and belly-landed at the de Havilland Flying School at Panshanger (then called Hogsnorten). Damage was not serious, the aircraft being jacked up the next day and flown out on May 5, demonstrating the type's strength and repairability. Geoffrey made another belly landing on May 29 at Hatfield, this time in B.IV DK291 when the undercarriage failed to lower.

Early in 1941 a significant development was initiated by plans for offensive sweeps by Mosquitoes without the night fighter radar fitted. They could carry two 113.4kg (250lb) bombs internally behind the cannon, and another two more under the wings. These



**Leavesden built Mosquito NF.30 MV529.** *Flight*

operations became known as Intruders, and with the clipping of the bomb vanes, two 227kg (500lb) bombs could be carried in the bomb bay. The prototype FB.VI, DZ434, first flew on June 1, 1942, going to Boscombe Down on the 13th with the new identity HJ662.

To give the increased range of the fighter, tankage for a further 686lit (151gal) of fuel was fitted behind the cannon in the space left by the bomb bay, the trial installation being made in W4096. In the fighter bomber, a smaller 227lit (50gal) tank could share the space with 2 x 250lb bombs. A basic wing was also developed, capable of withstanding the heaviest anticipated loads and easily adapted to any Mosquito version.

The radar capability began to improve from the fixed rudimentary arrowhead aerial in the nose to more effective installations protected by nose radomes. A thimble radome housing AI MkVII was fitted to DD715 in July 1942. After successful trials at the Royal Radar Establishment (RRE) at Defford, 97 MkIIs were delivered from the Leavesden production line to Marshall's for the nose housing four Browning machine guns to be replaced by a radome, commencing with HJ945 and 946 on January 2, 1943. The radar was fitted at Defford, and the first of what were to become the MkXII was delivered to 85 Squadron on February 28. A similar development of the more powerful Merlin 21 or 23 powered MkVI with the basic wing became the NFXIII, with fuel capacity increased from 2,486 to 3,255lit (547 to 716gal).

Powered by Merlin 25s and fitted with a new universal nose, the NF.XIX could accept either British or American radar. The initial conversion was DZ659, which was fitted with AI/SCR720 in January 1943, the Mosquito having been chosen as the aircraft to use 2,000 American radar sets then available. After eight weeks the first conversion was complete, being delivered to Ford for trial on April 1. The NF.XVII was created by the conversion of a batch of 98 MkIIs by Marshalls to carry the American radar, and these followed the previous batch.

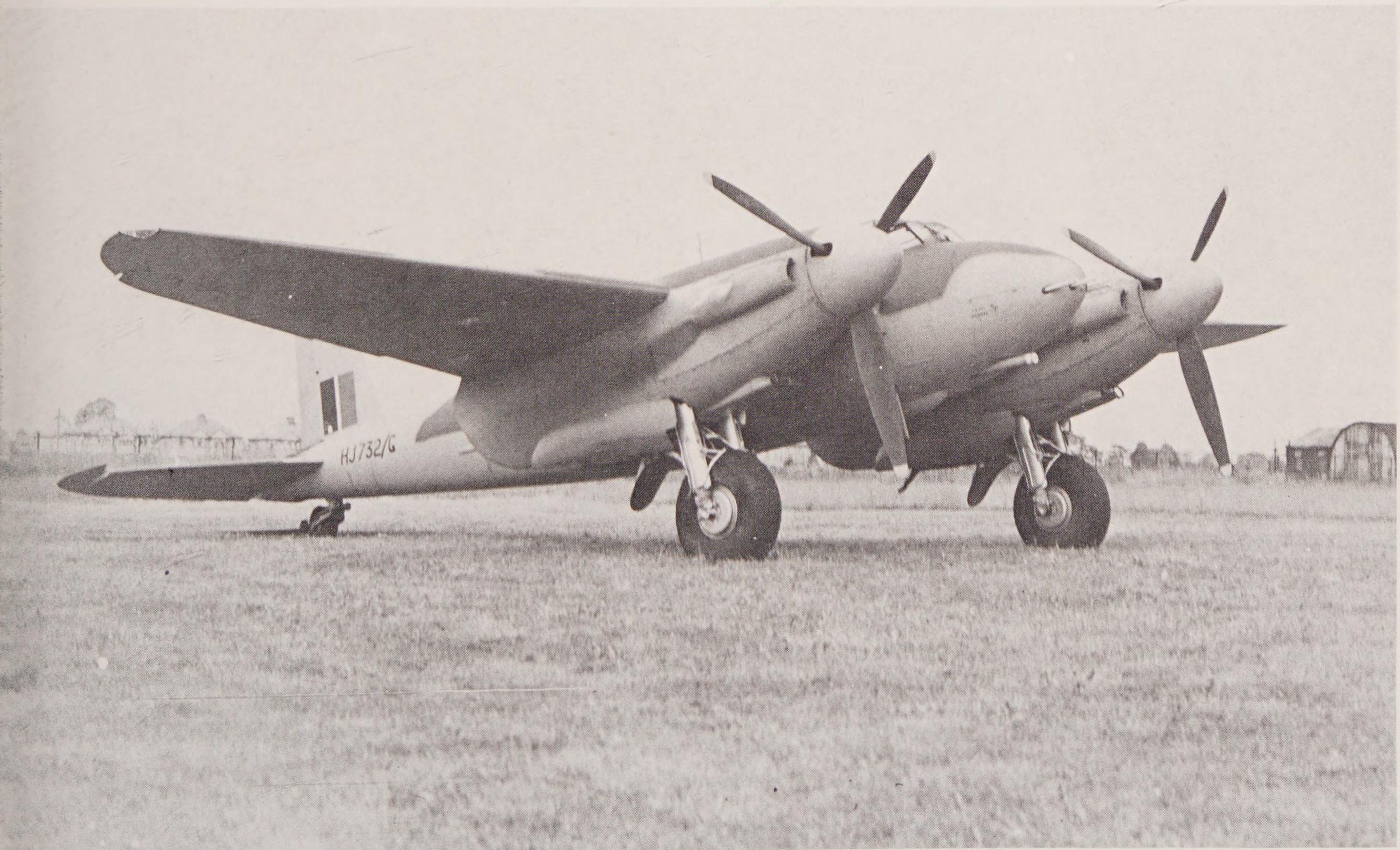
The next fighter improvement was the Mk30, a development of the NF.XIX powered by the two-stage Merlin 72s, MM686 being the first to appear in April 1944. The earlier aircraft were still effective, so the production lines were not interrupted by new variants, the Mk30 encountering exhaust shroud problems which delayed its entry into service until late 1944. The variant served with great success in Fighter Command. 100 Group, the USAAF in North Africa and, later, in the Belgian Air Force.

The final Mosquito fighter to see RAF service was the NF.36, which was powered by the higher-powered Merlin 113 and had improvements to the radar. The NF.38, with still better radar, never entered service with the RAF, but over half of those built were sold to Yugoslavia.

The FB.VI was such a successful aircraft that it remained in production and service without any significant changes. The only other fighter bomber version was the ship-busting tse tse MkXVIII, which retained the four Browning machine guns, but had the four 20mm cannon replaced by a six-pounder 57mm Molins cannon. The first of these large guns arrived at Hatfield in April 1943 for trial installation in HJ732. Initial firings in the butts took place on June 6, the aircraft being flown two days later and delivered to Boscombe Down on June 12, where 800 rounds were fired over a two-month period. Only a small number were converted, the type's first operational mission taking place on October 24. The Molins cannon could fire 25 shells in 20 seconds, and was supplemented by the nose-mounted machine guns, eight 27kg (60lb) rocket projectiles, two 227kg (500lb) bombs, and 227 or 454lit (50 or 100gal) drop tanks under the wing.

**The Merlin 114 powered Mosquito NF.38 prototype at Hatfield in January 1947.** *IWM*

**The development MkXVIII prototype HJ732/G fitted with a six pounder 57-mm., Molins cannon in place of the normal four 20-mm cannon.**



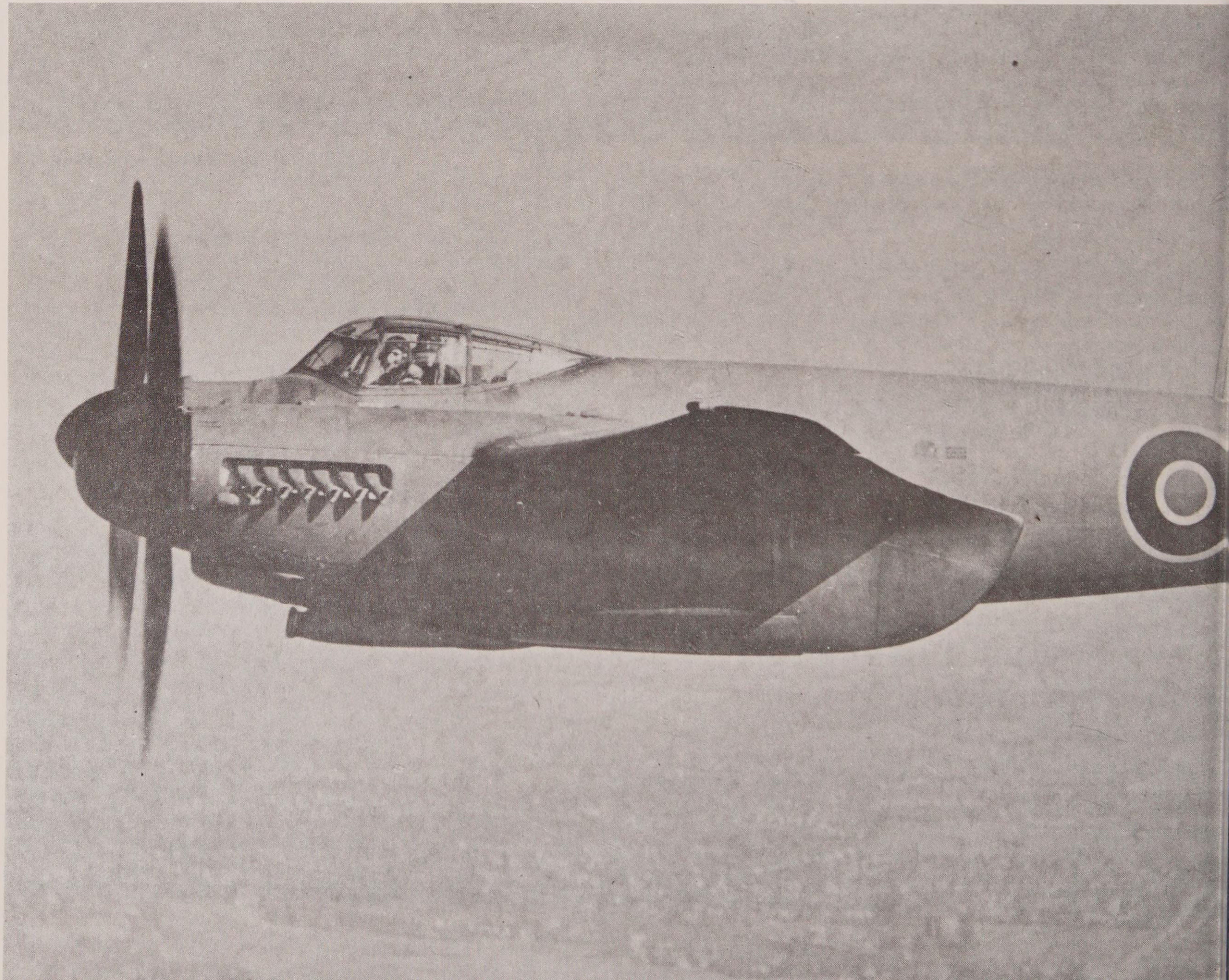
# MOSQUITO DEVELOPMENT

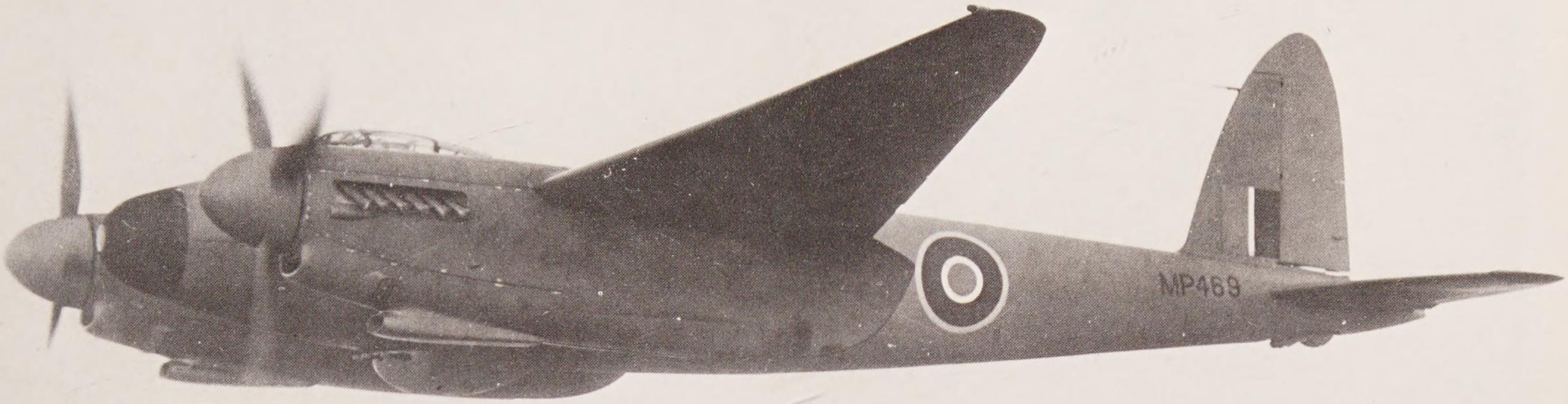
The versatility of the Mosquito manifested itself in its more extreme developments, where it proved capable of quick conversion to even more exacting duties. The high-altitude B.XV worked on by J. P. Smith, already mentioned, was an adaptation for ultra high-altitude fighting. The threat was the high altitude Junkers Ju86P, an old aircraft modified with new engines, extended pointed wing tips and a pressure cabin. These aircraft were mainly nuisance raiders, and because they were at the extreme of their performance they could only carry one 250kg (551lb) bomb, some of which were dropped on Bristol, Cheltenham and Newport. The main defence against these raiders was the Spitfire, but a two-stage Merlin 61 version was not then available, so the option was for a pressurised Spitfire with a single-stage engine or a two-stage Merlin powered aircraft with an unpressurised cockpit.

On August 24, 1942, a Ju86P was spotted over Berkshire at an estimated height of 11,582m (38,000ft), and dropped a 50kg (110lb) bomb at Camberley. A second aircraft was seen the same day, and the next day another climbed to about 10,363m (34,000ft) and then came lower to drop a 250kg (551lb) bomb in Hertfordshire. On August 29 two Debden Spitfires failed to intercept a raider at 11,887m (39,000ft), which dropped its bomb at Histon, Cambridgeshire. These high altitude raids were undertaken in clear daylight, and as well as using its extreme altitude for defence, the Ju86P could dive away rapidly from any defending Spitfires.

On September 5, the problem was brought home to Hatfield when, after dropping a 250kg (551lb) bomb on Luton, a Ju86P flew directly over the factory, watched by the Mosquito team. A Spitfire, sent up from Manston to intercept, fired at the raider, but stalled and missed at the high altitude. Only five Ju86Ps were converted, and with the break-up of the weather, flights ceased in September after twelve operations. However, this was unknown to the British, and fortuitous for the Germans, as an answer was about to be found.

The pressure-cabin equipped bomber prototype, MP469, was selected for urgent conversion in a similar manner to the Ju86P, with two-stage Merlin 61s, increased wing span and a pressure cabin, all in a wooden airframe. The four-gun nose, which had been cut from





*Above.* **The Mosquito B.XV high altitude prototype MP469 converted to a high altitude night-fighter with nose radar and an under fuselage four machine gun pack.** *Crown Copyright*

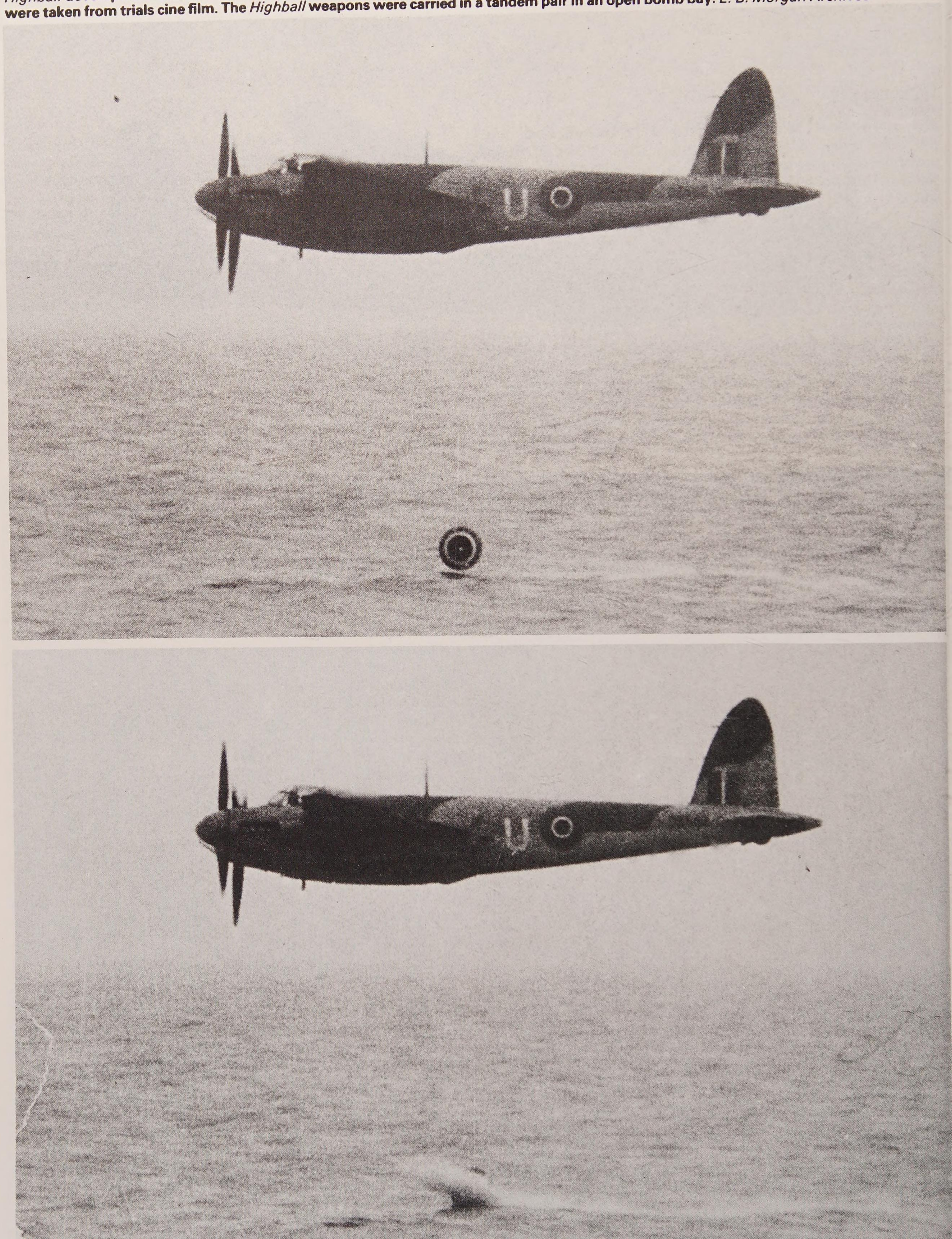
*Left.* **One of the four production conversions to NF.XV, DZ385 which first flew on January 3, 1943. It served with No. 85 Squadron at Hunsdon from March until August 1943, and later went to the School of Technical Training at Cranwell.** *Crown Copyright*

DD715 when the radome was fitted, was grafted on to replace the bomber nose. Much of the heavy armour plating was removed, and four-blade propellers were borrowed from the prototype. Additional lightness was achieved by removing the bullet proofing of the fuel tanks, reducing the tankage, fitting smaller, Beaufighter-type, wheels and many other details. The pointed wings spanned 18m (59ft). It was hoped that 13,106m (43,000ft) could be reached.

Only a week after go-ahead the modified aircraft was rolled out, weighing 7,347.7kg (16,200lb), 1043.3kg (2,300lb) lighter than a standard MkII. It was flown by John de Havilland on September 14, and next day easily reached 13,259m (43,500ft) thereby proving the answer to the elusive Ju86P. On September 16 MP469 was collected by Fg Off Sparrow of 151 Squadron, a small, light man, and flown to Northolt to await the high raiders, who in the event never came. On patrols, it was found that the Mosquito took about 35min to reach 12,801.6m (42,000ft) with sufficient fuel remaining for two hours' flying. Pressurisation was a modest 0.14kg/sq cm (2lb/sq in), but this reduced the cabin altitude by around 3,657.6m (12,000ft). The pilot, who, to save weight, was usually the sole occupant, had to breath oxygen, of course. By further reducing the fuel load 13,716m (45,000ft) was reached; slightly higher than the specially developed Spitfire VII.

With the daytime high altitude threat out of the way, it was then feared that similar operations would be flown at night to distort defensive radar. However, AI MkVIII was not affected, so MP469 once again underwent a change of nose, the four machine guns being replaced by a radome housing this radar, accompanied by the associated hydraulics to drive the equipment. As this aircraft had begun life as a bomber there were no underfuselage cannon, so to restore some offensive armament, four machine guns were installed

**_Highball_ development trials using a Mosquito B.MkIV showing the sequence of the first impact and bounce from the water. These shots were taken from trials cine film. The _Highball_ weapons were carried in a tandem pair in an open bomb bay.** *E. B. Morgan Archives*



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in a blister beneath the fuselage, on similar lines to the later Jet-powered English Electric Canberra B(I)8. With two 109lit (24gal) wing fuel tanks restored and a second crew member, the weight was increased to 7,892kg (17,400lb), but on test, even at 12,801m (42,000ft), its climb rate was still 2.54m/sec (500ft/min). While trials continued at the A & AEE and RRE, a decision was made to convert four more B.IVs; DZ366, '385, '409, and '417, which were designated NF.XV.

These new fighters were delivered to the Fighter Interception Unit (FIU) at Ford by mid-March 1943, but by the end of the month they had joined 85 Squadron at Hunsdon, commanded by Wg Cdr John Cunningham, where they formed a special "C" Flight for operational trials. During these trials, from the end of April to mid-August, the greatest height reached was 13,594m (44,600ft) in MP469, but no contact was made with the enemy. DZ409 and '417 were used by the RAF at Farnborough for pressure cabin research and then all of the aircraft, apart from DZ417, which had been written off at Farnborough, were allocated to ground instruction. So ended the relatively inactive career of the most outstanding fighter in service with the RAF.

Number 617 Squadron is well known for its dam busting raid, using the bouncing bomb devised by the late Sir Barnes Wallis and code-named "Upkeep". Its sister squadron, No 618, may have become equally famous had the plans to fit Mosquitoes with two smaller and similar weapons, code-named "Highball", ever come to fruition. 618 Squadron was formed as a special unit at Skitten, a little-used Northern airfield, on April 1, 1943, its purpose being to stage a daylight attack on the Tirpitz in the Alton Fiord. Because a daylight attack would reveal the top secret method of attack, it was to be a one-time operation. It was a highly hazardous task to which the Mosquito was best suited, as it was the smallest and fastest target capable of carrying a large enough load of explosives to achieve the object. Two mines were carried in tandem in the open bomb bay. Rotated backwards at about 1,000rpm, they had to be dropped from an altitude of 7.6m (25ft) about 1609m (one mile) from the target. Each pair of mines would bounce along the water one behind the other, clearing the boom and net defences placed around the ship to stop torpedoes. On striking the side of the ship, the mines would sink and explode their 272kg (600lb) charge under the hull, being triggered by a hydrostatic fuse set at a pre-determined depth.

On March 24, 1943, the trial installation Mosquito B.IV, DK290, was flown into Heston for modification. With a planned date of May 15 for the operation from Sumburgh, time was very short. Meanwhile, Sqn Ldr C. F. Rose formed up his squadron for intensive weapon development and training using Mosquitoes borrowed from Marham.

As tests progressed, starting with wooden-skinned weapons to test techniques and low-level training sorties against a target ship, snags were inevitably found. As in the original "Upkeep" weapon, the compromise between strength and weight proved a problem, with the mine cases breaking apart. The release gear also gave problems, and these snags caused an inevitable postponement of the attack date. The fear was that the enemy would discover the method of attack used on the dams, but in fact they believed, owing to the cover of darkness, that the weapons used were rocket bombs.

The first pair of modified Mosquitoes were delivered on May 14, and the remaining 13 had followed by the end of the month, but still "Highball" was not operating successfully under test. However, releases had improved by July 7, and the 81cm (32in) diameter store, cased in 7mm (1/8) steel, was standing up to the impact. The sighting of the weapon was the next problem.

Obviously, other means of destroying the Tirpitz were being considered, as in mid August it was decided to use the "Highball" weapon as a depth charge against submarines, no doubt without the complication of rotation before release. After hurried trials a week later, the order was withdrawn, and 618 Squadron was detailed to deliver its special Mosquitoes to Shawbury for storage.

At this time further "Highball" tests were undertaken in tunnels by dropping them at the entrance and rolling them inside where they would blow up. With the success of anti-shipping trials at the same time, 618 Squadron was re-issued with its aircraft at Wick to retrain, and a further batch of 250 weapons was ordered from Vickers. Sighting was still a problem, as was lack of operational flying by the crews, so detachments were made to 248 Squadron, flying the Mosquito MkXVIIIs, when Sqn Ldr Rose was killed.

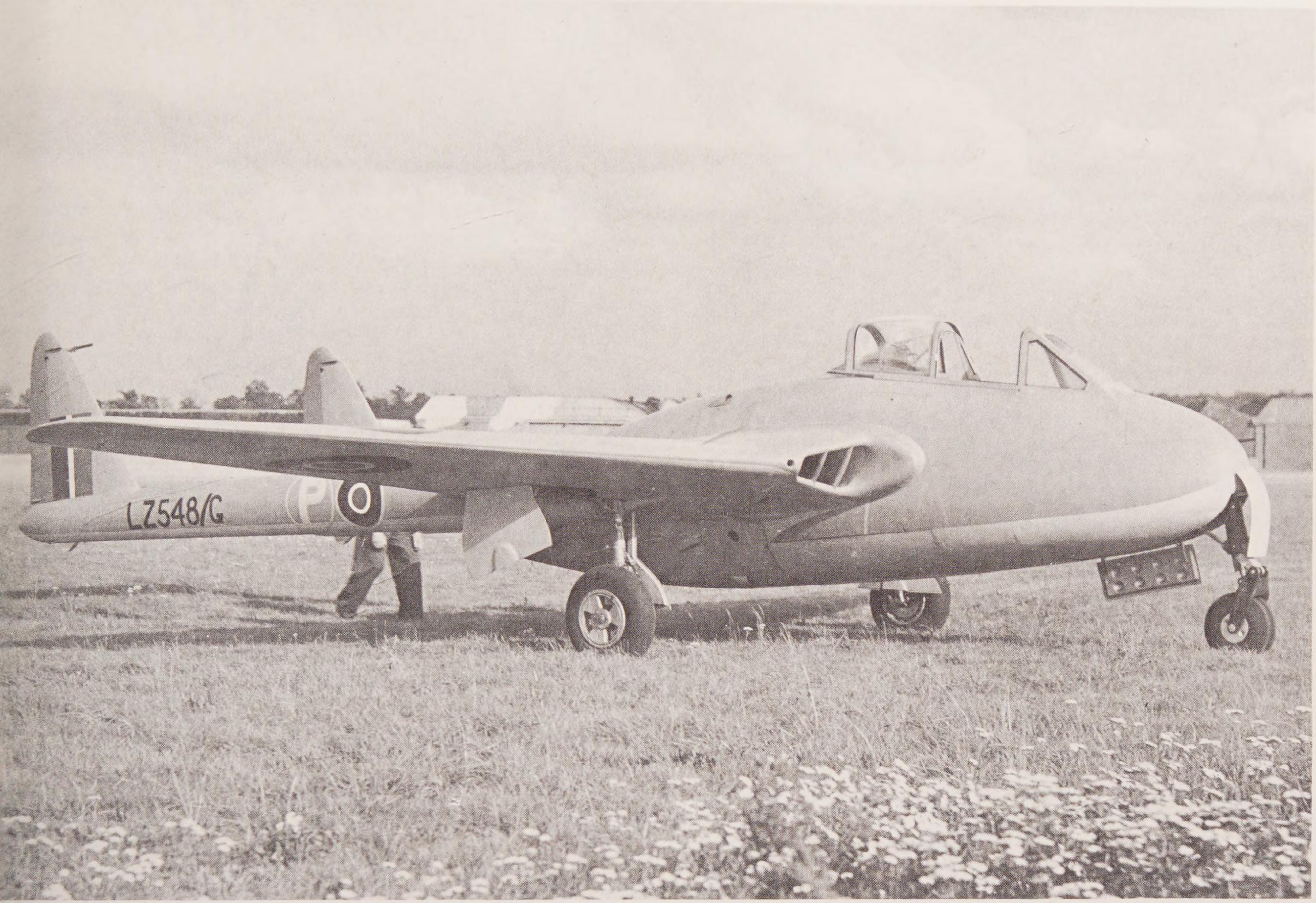
The Americans were also taking an interest in "Highball" by this time, Avengers and Mitchells being adapted to carry the weapon, and plans prepared for four to be carried in the Martin B–26 Marauder.

On July 9, 1944, it was decided that 618 Squadron should be assigned to anti-shipping operations in the Far East under the code name "Oxtail". Airspeed and Marshall's were given the urgent task of fitting uprated Merlin 25 engines with 36lb boost, additional armour plating, air turbines, power for spinning the stores, arrester hooks for carrier-borne operations, four-bladed propellers and making other changes.

The Airspeed airfield at Portsmouth was rather small, with obstructions in all the worst places. When the first two aircraft, B.IVs, DZ554/G and DZ555/G, were flown over from Middle Wallop on July 6, 1944, the RAF pilots opted to land them at the larger airfield of Thorney Island. Ron Clear and Bob Milne were Airspeed test pilots at the time, and they were asked to collect the aircraft and bring them into Portsmouth for the work to commence. Neither had flown Mosquitoes before, but, armed with a check list, they began the ferry flights, although the checks had to be hurried due to the common fault of Merlins overheating when run for long periods on the ground. Bob Milne decided to go first, and advised Ron Clear to follow in 30 minutes if he heard nothing. Ron did so and on arrival over Portsmouth saw Bob coming in over the 9m (30ft) high sea wall, drop the aircraft on to the grass close to the perimeter and stop in the remarkably short distance of about 457m (500 yards). Ron attempted to do likewise, but found his early attempts were more likely to demolish the aircraft and the Airspeed factory, at which he was headed. Eventually, after doing some slow speed checks, Ron came in low and slow over the ramparts and stalled the aircraft on the grass as near as possible to the start of the 914m (1,000 yard) grass strip in a three-point landing to create maximum drag.

Although this landing was a success, it went way past Bob Milne's stopping point, and when questioned about this performance Bob Milne commented that it was "just the difference between the men and the boys". Much later, Ron discovered the real reason. When the engines overheated on take off, Bob had so hurried his checks that he forgot to check the catch of the emergency hatch above his head, and as he took off it blew away. As the conversion of the aircraft was top priority he decided to press on, but checked the stall to see if it had any effect. Fortunately it didn't, but it did give Bob a clear indication of the stall, as the suction raised the top of his helmet. After doing his initial approach to Portsmouth by the book, he found the airfield too small, and used his helmet shaker as the ultimate stall warning to achieve an extremely short landing.

Meanwhile, both at take-off and on one of the landing attempts, Ron had experienced the violent swing to which the Mosquito was prone. After the Airspeed modifications Ron delivered the same aeroplane to Wisley, which was then a narrow grass strip, and again experienced the violent swing on landing. The sequel to this story came some time later, when Ron was waiting at Thorney Island to take off in a Halifax towing a Horsa glider. The same Mosquito that he had been flying came in to land, and on touchdown, it once again swung violently and skidded sideways, removing the undercarriage.



**The D.H.100 Vampire – code named "Spider Crab".**

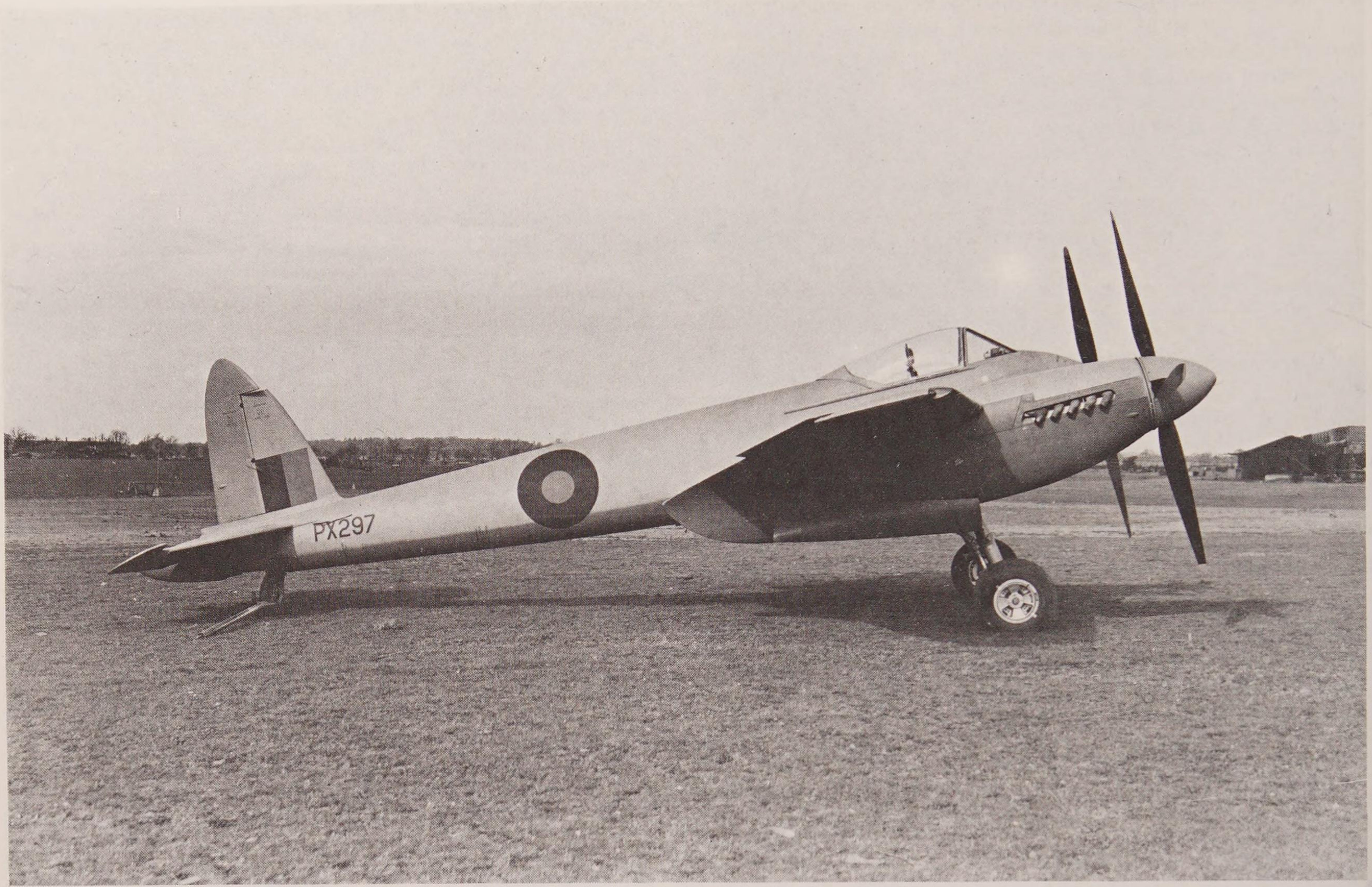
In the subsequent enquiry it was found that the major cause was the seepage of water from the installation of aerials on the upper fuselage, which had not been sealed. The tail-down attitude of the aircraft on the ground had caused the water to seep through the balsa sandwich down to the tail, causing the centre of gravity (cg) to move aft. This, combined with the extra weight of the equipment aft of the cg, made the aircraft practically uncontrollable, although it was later repaired.

Training continued for 618 Squadron using the runway at Beccles, marked out to resemble the deck of a ship. A total of 24 Mosquito IVs was modified for this task, all being returned to the Squadron in September 1944, and three PR.XVIs were added to search for suitable Japanese shipping. Originally, the plan had been to fly all the Mosquitoes on to the carriers HMS *Fencer* and HMS *Striker*, successful landings and take-offs having been achieved with the PR.XVIs on October 10. Capt Eric "Winkle" Brown had already proved Mosquito deck landings possible with the world's first deck landing of a twin-engined aircraft on HMS *Indefatigable* on March 25 the same year. However, to minimise the risk all the aircraft were loaded on George V Dock at Glasgow, and on October 31 the carriers sailed, reaching Melbourne two days before Christmas.

Shore-based training continued, but no offensive attacks were made, despite many tempting targets. The end came on June 29, with the disbandment of the Squadron, staffed by highly skilled, highly trained experts who were never used. The 125 "Highballs' were statically destroyed, bringing the story to a virtual end, because the authorities were worried that the secret weapon would be copied and used against ourselves if seen by the enemy. Bearing in mind the many problems met and overcome in the development, it would have taken many months for the enemy to perfect the technique, by which time many more of their ships would have been on the ocean bottom.

Another development project being considered during the war was an enlarged Mosquito bomber, the D.H.99, powered by two Napier Sabre engines, initial proposals being made by de Havillands on October 16, 1941, before the original concept had been fully accepted. Assuming that two twin-Sabre D.H.99s were equivalent to one of the contemporary four-engined heavy bombers, it was suggested that they would have twice the operational altitude, 241km/hr (150mph) greater speed, and deliver more bombs more efficiently for the same man-hours in building, maintenance and flying. Once again, wooden construction was planned for all its advantages, including rapid introduction to sevice.

In December, the project was renumbered D.H.101, as D.H.99 was a code allocation to spare parts and D.H.100 had been allocated to what was to become the company's first jet fighter, the Vampire, originally code-named "Spider-Crab". With Mosquito development going apace and Vampire development starting, de Havillands were warned not to take on too much. However, the



**The D.H.103 Hornet high speed fighter developed from Mosquito experience.**

answer came on April 4, 1942, when they were informed that the Sabres were not to be available, and Rolls-Royce Griffons were suggested as an alternative. As these would not give the desired performance, the D.H.101 was dropped and replaced by the D.H.102, a larger Series II Mosquito to Specification B.4/42 powered by two Merlin 61s and capable of carrying a 1,814kg (4,000lb) bomb internally and two 500lb bombs beneath the wing.

Construction was started and progressed quite well initially, but without much enthusiasm, as the design offered little improvement over the existing Mosquito, and urgent work was also in progress on the demanding high-altitude MkXV developments. Additionally the D.H.103 Hornet high speed fighter was beginning to look an exciting prospect, and official interest in the D.H.102 was declining. In December, after discussions to clarify the situation, de Havillands were told that the D.H.102 would probably be dropped. Then, in April the following year, the 1,814kg (4,000lb) bomb Mosquito was ordered, a conversion being carried out on B.IV DZ594, which flew by July as a straight Mosquito development. Go-aheads were also given for the jet-powered Vampire using Mosquito-type wooden construction in its fuselage nacelle, and the Hornet, which flew on July 28, 1944. Again using mainly wooden construction, its special Rolls-Royce engines gave it a top speed of 756km/hr (470mph), better than any other production piston-engined aircraft.

# MOSQUITO PRODUCTION

The Mosquito, with its wooden construction and simple structure and systems, was designed for production. The commonality of parts and wide diversity of sub-contractors, ranging from those producing whole wings to the cottage industry supplying electrical assemblies, kept an average of two Mosquitoes a day coming out of the Hatfield factory, as well as those rolling off other assembly lines. Useful ideas which speeded production included the one-piece wing, the fuselage built in two half shells which were fitted out before final assembly, and the adjustment of the aileron balance by shims on the hinge brackets to alter the gap between the shroud. Once these shims were correctly assembled, they could not change, unlike the moveable trim tab used on other aircraft. Modifications and repairs were easier to incorporate, and it was possible to obtain a higher surface finish than with metal aircraft. As has already been mentioned, the non-strategic wood used non-strategic labour; these workers were able to exercise their skills in a more productive way than would have otherwise been possible.

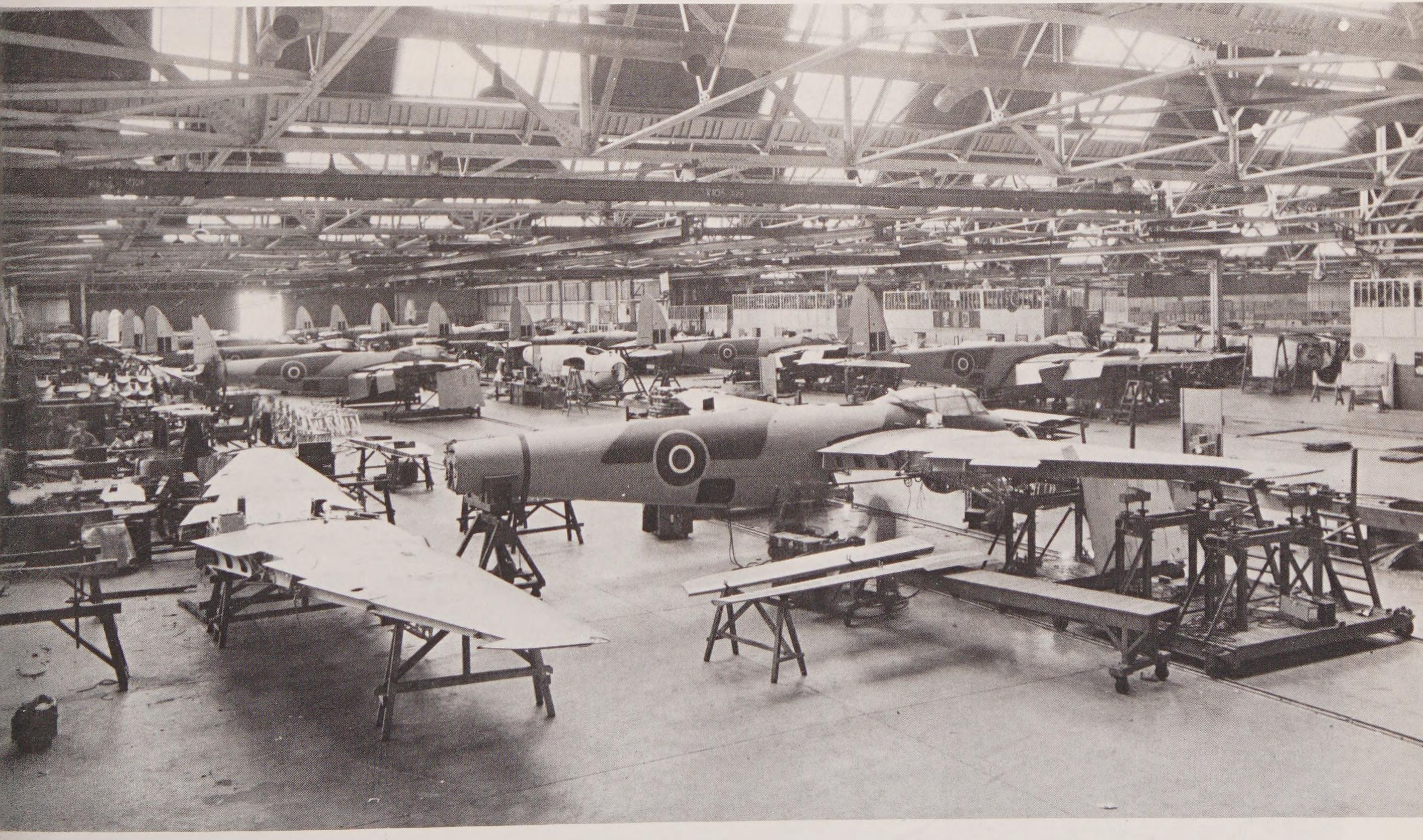
A staggering total of 7,619 Mosquitoes was built in all factories, of which 6,710 were built during the war. Wartime production out of the parent factory at Hatfield alone was 3,054 Mosquitoes, in addition to the repair of 1,252 more in the factory and in the field. Like all warplanes, the Mosquito was designed as a relatively short-life aircraft which had to work well all the time and whenever it was required. However, its repairability kept it in operational use much more consistently and at much less cost than some of its complicated metal colleagues.

In addition to Hatfield Mosquito production, lines were set up at de Havilland's shadow factory at Leavesden near Watford, Standard Motors at Coventry, Percival Aircraft at Luton and Airspeed at Portsmouth, as well as with the de Havilland companies in Australia and Canada. After the war Mosquito lines were also established at the Airspeed factory at Christchurch, and the last batches of aircraft were built at the enormous ex-Vickers factory at Chester, taken over by de Havillands in 1948.

All types of Mosquito were built at Hatfield, as well as other aircraft types, while the lines at Leavesden and Coventry concentrated on fighter variants and Luton produced bombers.

In addition to controlling Mosquito production, de Havillands repaired and overhauled more than 9,000 Merlin engines, manufactured more than 12,000 propellers (as well as some 90,000 for other aircraft types), and overhauled and repaired nearly 41,000 propellers. This level of activity could only be achieved by sub-contracting widely, which also reduced the risk of a vital lifeline being interrupted by bombing. Whole factory departments were also dispersed around the locality for the same reason. Female labour was used extensively, and played a major and essential part in achieving the high level of output. An amusing incident occurred

**The Mosquito production lines at Hatfield with the aircraft moving sideways on a U-shaped track.**



when a group of women were told that they were assembling, with rubber pipes etc., the pilots' long range relief kit. After finding this out they couldn't bear to touch the job any more. Another advantage of the Mosquito's widely dispersed manufacture was that, although the numbers of employees in the factories increased, it did not do so as much as expected, and did not cause a massive discharge of labour like that at the end of the First World War.

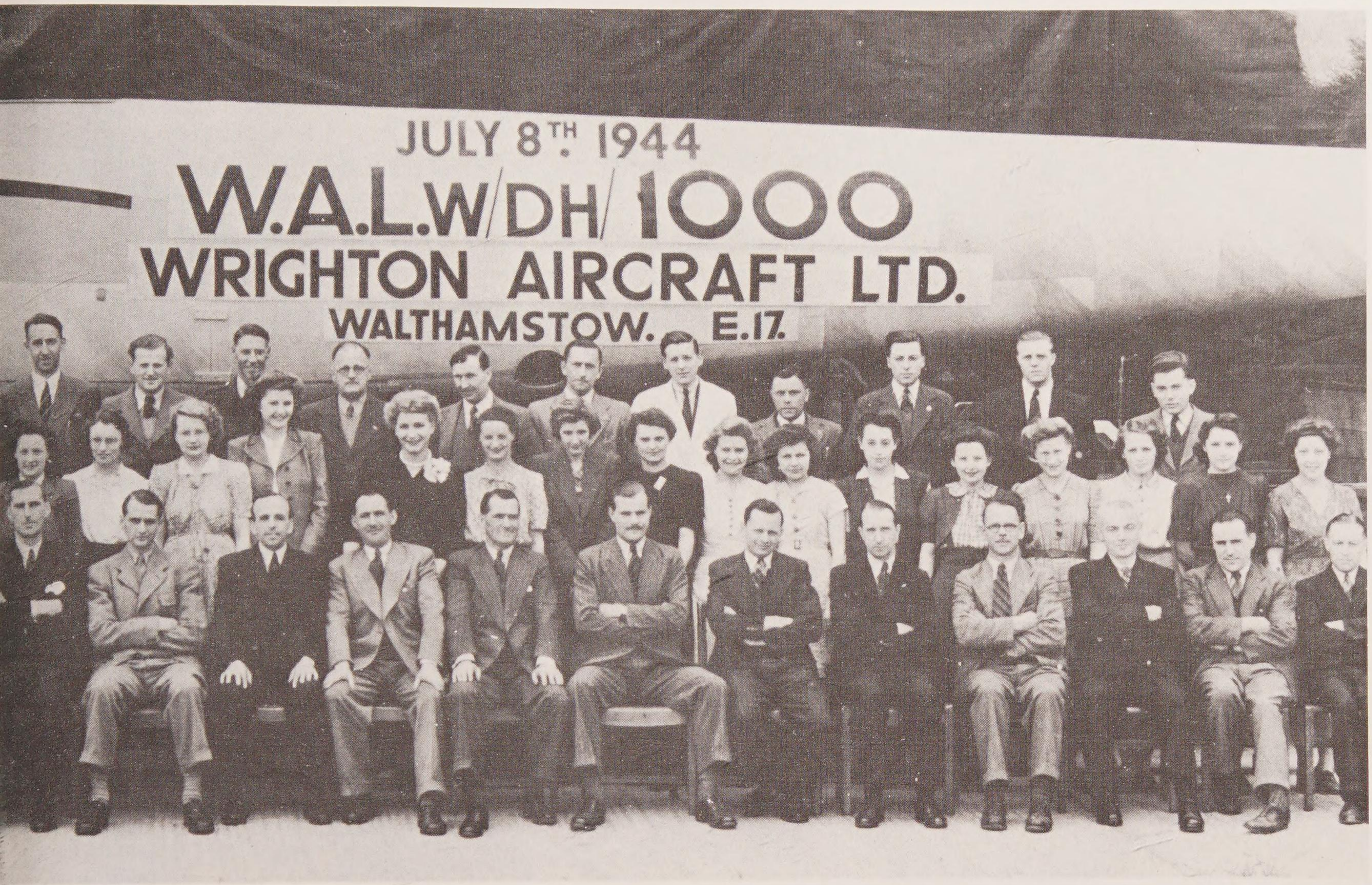
The original company promise to deliver the first 50 Mosquitoes by the end of 1941 caused much internal criticism, but it was a promise which had to be made to keep the aircraft alive. Despite the odds, it could have been fulfilled if the aircraft had remained bombers, and not been modified to fighters (30) and reconnaissance aircraft (20). In fact, 20 were completed in the time, and the 50th by Mid-March 1942.

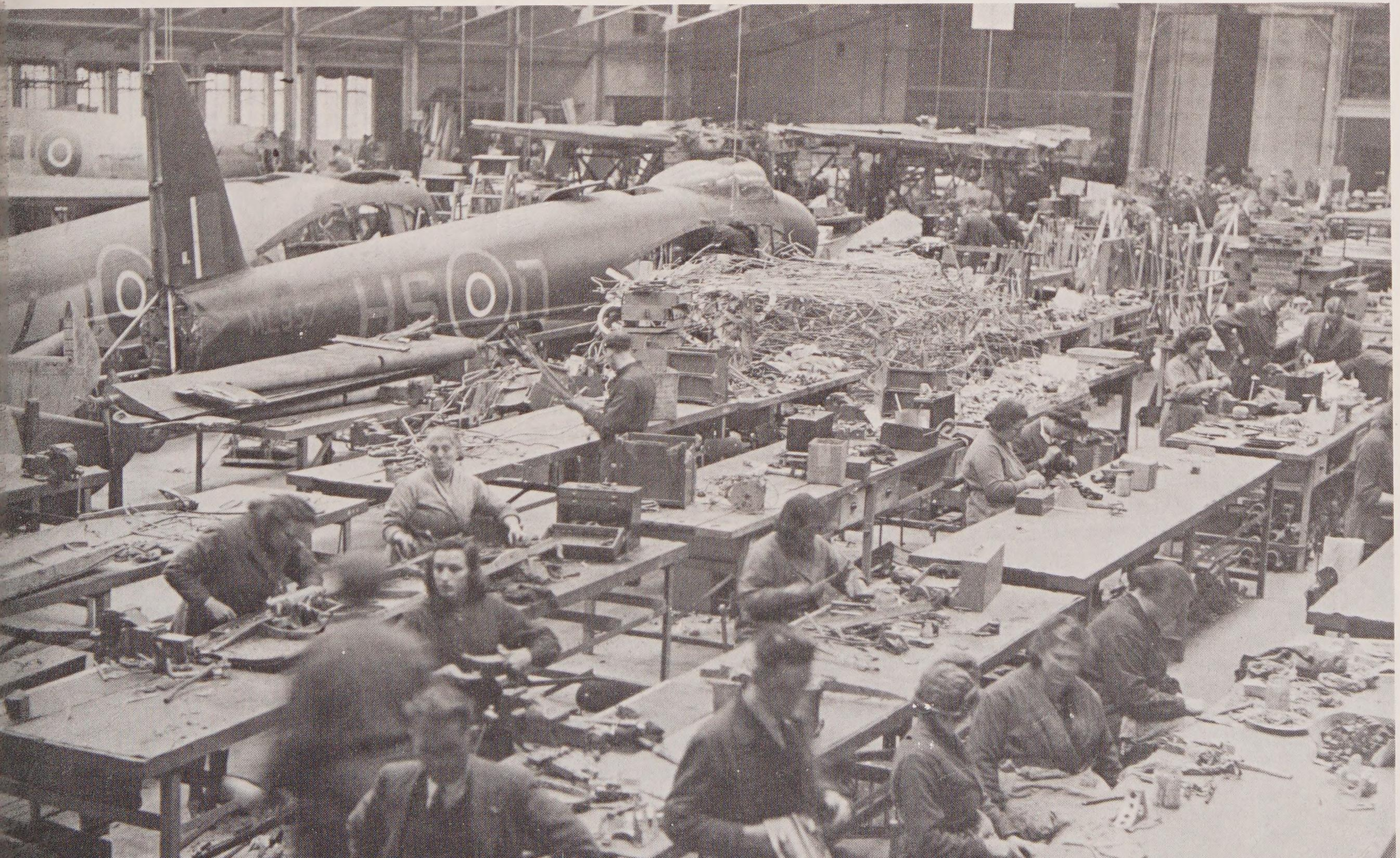
The first operational Mosquito was W4055, a PR.I handed over on August 7, 1941. The first production bomber, W4057 was delivered on September 23, and Leavesden's first aircraft, a dual-control fighter T.III, flew to Hatfield at the end of January 1942 for flight testing. Using the combined resources of Hatfield and Leavesden, the 1,000th aircraft was delivered by the end of June, 1943, with production running at the rate of about 20 a week. As production built up, Hatfield shed the other work which the

*Right.* **One of the larger sub-contractors was Wrighton Aircraft of Walthamstow in London, who produced their thousandth Mosquito fuselage on July 8, 1944. All these sub-contractors had to maintain the high standards required, and were regularly visited by de Havilland inspectors to check the quality of the work.**

*Lower right.* **The Mosquito Repair Organisation, salvage hangar at Hatfield on May 18th, 1944 containing fuselages from No. 109 Squadron (ML957 HS-D) and No. 96 Squadron (-404 ZJ).**

*Below.* **The smallest Mosquito sub-contractor was a group organised by Mr & Mrs Hale who assembled electrical parts in their garden shed in Old Welwyn, Herts.**


JULY 8TH 1944
W.A.L.W/DH/1000
WRIGHTON AIRCRAFT LTD.
WALTHAMSTOW. E.17.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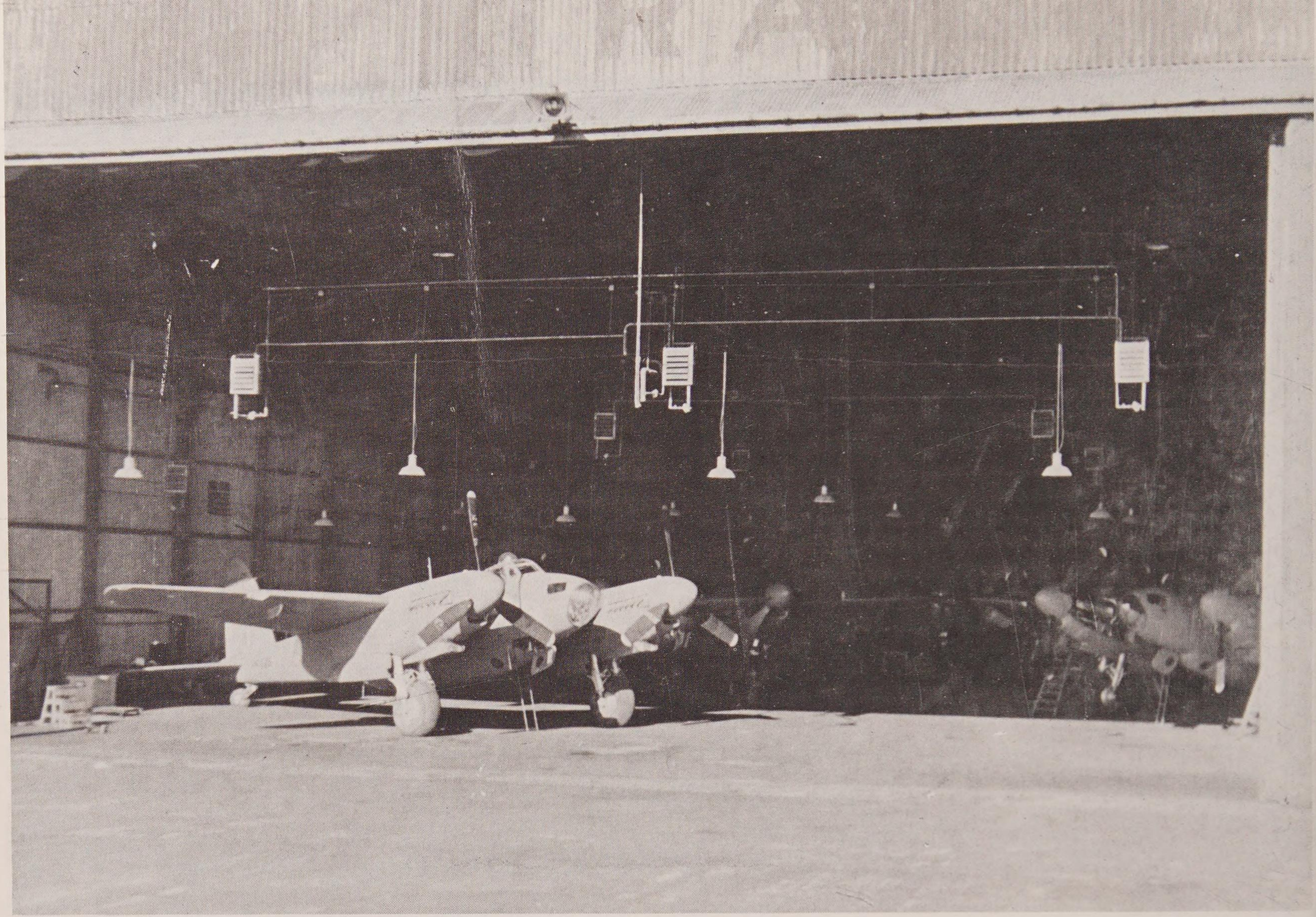


**Mosquito PR.34 PF625 assembled at the Percival Aircraft factory at Luton.**

Government had originally been so keen for them to retain. Airspeed Oxford production was moved out, Tiger Moth production was taken over by Morris Motors, who re-drew and productionised the aircraft for their industry, and Dominies went to the Brush Coachworks at Loughborough.

Confusion reigned during the early days, as de Havillands were trying to gear up to meet a growing demand from a customer who couldn't decide how many of which variant he wanted and the relative priority. De Havillands needed contract cover to get jigs and tools produced for quantity production, to order sufficient materials and equipment, and to recruit and train the additional labour. There was no doubt Mosquitoes were needed, but which type? The aircraft had been designed as a bomber, but fighters became a priority, so front fuselages had to be cut off and new ones spliced on.

From mid-1940, de Havillands had been preparing the Second Aircraft Group duplicate shadow factory at Leavesden to undertake the production of Armstrong Whitworth Albemarles. This was later changed to Vickers Wellingtons at a top planned rate of 300 per month. Much to the Company's relief, this factory became a major Mosquito production unit. Not only did this involve setting up a completely separate production organisation, but a factory had to be designed and built. The First World War Alliance factory at Acton made Mosquito wings, and the Aldenham bus depot made fuselages, serving as dispersed sites for Leavesden. At Hatfield it was planned to disperse 60 per cent of the production around the local district, leaving 3,500 people working at Hatfield, about the same as today.

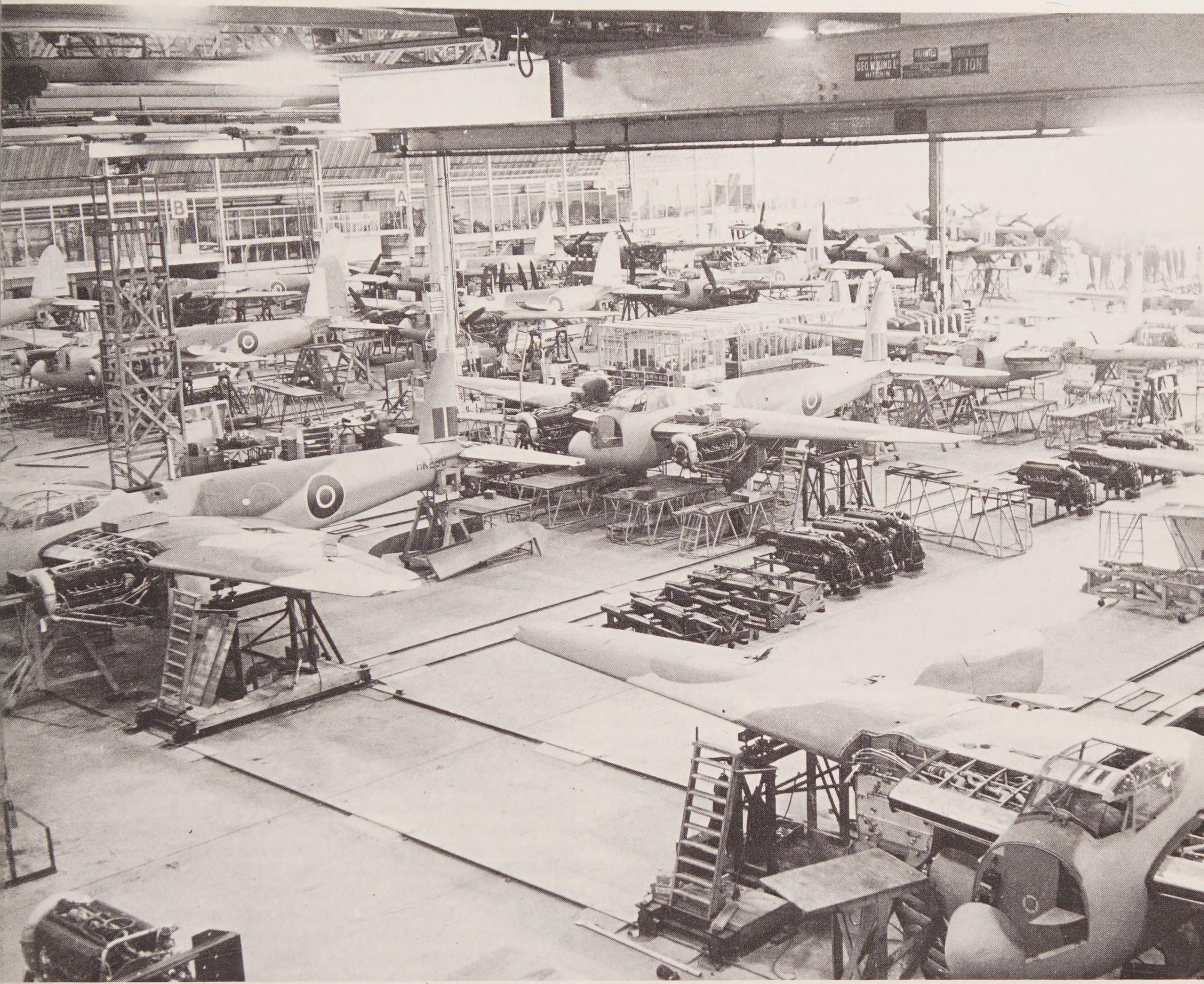
The sub-contracting organisation was built up during 1941, starting in 1940 with the two High Wycombe furniture makers E. Gomme Ltd and Dancer and Hearne Ltd making jigs, wings spars and other wooden assemblies. The motor engineers Vanden Plas and H. J. Mulliners make some of the metal fittings.

The old 94 shop, which took the full blast of the bombing in October 1940, was repaired and earmarked as a future Mosquito Repair Organisation, the buildings still being referred to as the MRO by some old hands at Hatfield. While waiting for business, and to get some experience, a supplementary production line was set up.

In May 1941, early in the build-up of Mosquito production at Hatfield, Ernest Grinham, a director of Standard Motors, was seconded to de Havillands to use his motor industry experience to organise the line. No doubt there was a connection with the Standard Motors Mosquito production line at Coventry, and possibly with the fact that a number of de Havilland directors selected Standard Vanguards as their mode of transport after the war.

In the early stages, when the contracts were limited to fighters, a number were converted to, or completed as, dual control aircraft. These were not intended as trainers, but were so built to enable the crew to share the flying. In the event of a pilot being incapacitated, of course, the co-pilot/navigator/bomb-aimer might have a chance of getting home.

By July 1941 the Ministry of Aircraft Production was talking of ordering more than 500 Mosquitoes, with total output from the combined resources of Hatfield, Leavesden and de Havilland Canada growing to 150 aircraft per month. By the end of the month, plans were well advanced at Downsview, Ontario, and although



**The Leavesden production lines concentrated on fighter versions, a batch of MkIIs being shown.**

there were thoughts about American production, these came to naught.

Finally, in mid-July, bombers were requested by rearranging the initial contracts to allow ten of the PR aircraft in Contract 69990 and the last 50 of the 200 in Contract 555 to be converted. Had some of this chopping and changing about been avoided, Mosquitoes probably would have reached service sooner. Fortunately, the wooden structure was easier to alter than that of a similar metal aircraft. On the other hand, that may have encouraged modification.

The Ministry of Aircraft Production needed continual prodding to ensure that sufficient orders were placed to allow long term planning. In peacetime a company could gamble commercially by ordering materials and equipment in advance, but with the shortages of wartime, priority could only be determined with an official contract number. The required rates of production would rapidly eat up initial orders, and care had to be taken to ensure continued production. The monthly production rate requirement gradually grew from 150 to 160 and then to a possible 200, requiring more capacity, and bombers were to start in January 1942. Canadian production for the RAF and RCAF was to commence in September 1942, using British supplied equipment, and built up to 50 aircraft a month by May 1943. As the rate increased allowance had to be made for spares, which would account for 20 per cent more production. The aircraft built had to be kept operational.

Although the ordering level had improved by January 1942, with contracts covering 1,778 aircraft at Hatfield (928), Leavesden (450) and Canada (400), the great challenge was to turn these orders into operational aircraft. Over 50 hours a week per person were being clocked up in the factory, with management working 12-hour days and taking half a day off per week when they had to. Then, in early 1942, de Havilland Australia was brought into the programme.

Thus began another exercise to ship out drawings, tools, parts and people, running the gauntlet of enemy submarines, warships and aircraft.

By April 1942 the folly of concentrating on fighter production was becoming a worry, and there was a growing need for bombers. In May 1942 an additional 202 Mosquitoes were ordered from Hatfield, and then another 59. Canada were told to expect a further order for 1,100, and at the end of the month 350 FB.VIs were ordered from Hatfield and 360 from Leavesden. In one month orders had reached 3,849 aircraft, and Hatfield was still trying to achieve double figures.

The sub-contractor organisation grew, involving a wide range of skills which had to be rapidly and effectively channelled to supply the main production lines. De Havillands ordered the materials, supplied them to the sub-contractors and received the finished products, often built to high degrees of accuracy. About 400 organisations were feeding the assembly lines. The number of employees at Hatfield was as low as 4,700, with another 2,000 dispersed locally, and 3,000 were employed around and at Leavesden.

In December 1942 Standard Motors were brought in with contracts for 500 Fighter Bombers, the first aircraft to be completed in April 1943 and production rising to 35 by December. In fact, the first aircraft, HP848, was rolled out at Ansty, Coventry, in mid June, taking the place of Oxfords. Ansty was the final assembly factory and airfield, while major assemblies were built in the suburban factory at Canley. The initial order was followed by another for 300, final production eventually totalling 1,066, the last of which was FB.VI TE932, delivered into storage on December 21, 1945.

Once Standard Motors' production line had been set up, with a great deal of Hatfield effort, Airspeed were considered, but by the time they were established in production the war was over.

Early in 1943 the Germans attempted to sabotage Mosquito production. The gentleman concerned was Eddie Chapman, a skilled safe-blower who was imprisoned in Jersey when the Germans occupied the Channel Islands. The Germans believed they had persuaded him to work for them in exchange for his freedom, but set him a number of tests to make sure. His first test-drop was to be over England, and he was given a radio set to advise of his successful arrival. On landing, Chapman thought he would make his escape by ditching his radio and giving himself up to the British authorities. However, he discovered by chance that he had been dropped in France to test his loyalty, and he quickly radioed back, passing the test.

On his next test in December 1942, he was dropped near Ely to sabotage the de Havilland factory at Hatfield. By this time he was already known to MI5 as a double agent, with the code name Zigzag. He had a lucky escape on this arrival, as his aircraft was shot down minutes after his jump.

Eddie Chapman located his target, the power house just inside the main gate, by donning overalls and mixing with the workers at lunchtime. He then had to enter the factory illegally without detection, and so, together with a Major Ryde, he was driven to a point close to a group of houses called Smallford on the night of January 2, 1943, and made his way across the fields, through the aerodrome's wartime boundary fence to the power house. Having proved the exercise possible, Eddie Chapman then had to steal some explosives (the Germans had not provided him with any) so that the Germans' suspicions were not aroused. He successfully burgled a quarry at Sevenoaks, which no doubt was reported in the newspapers.

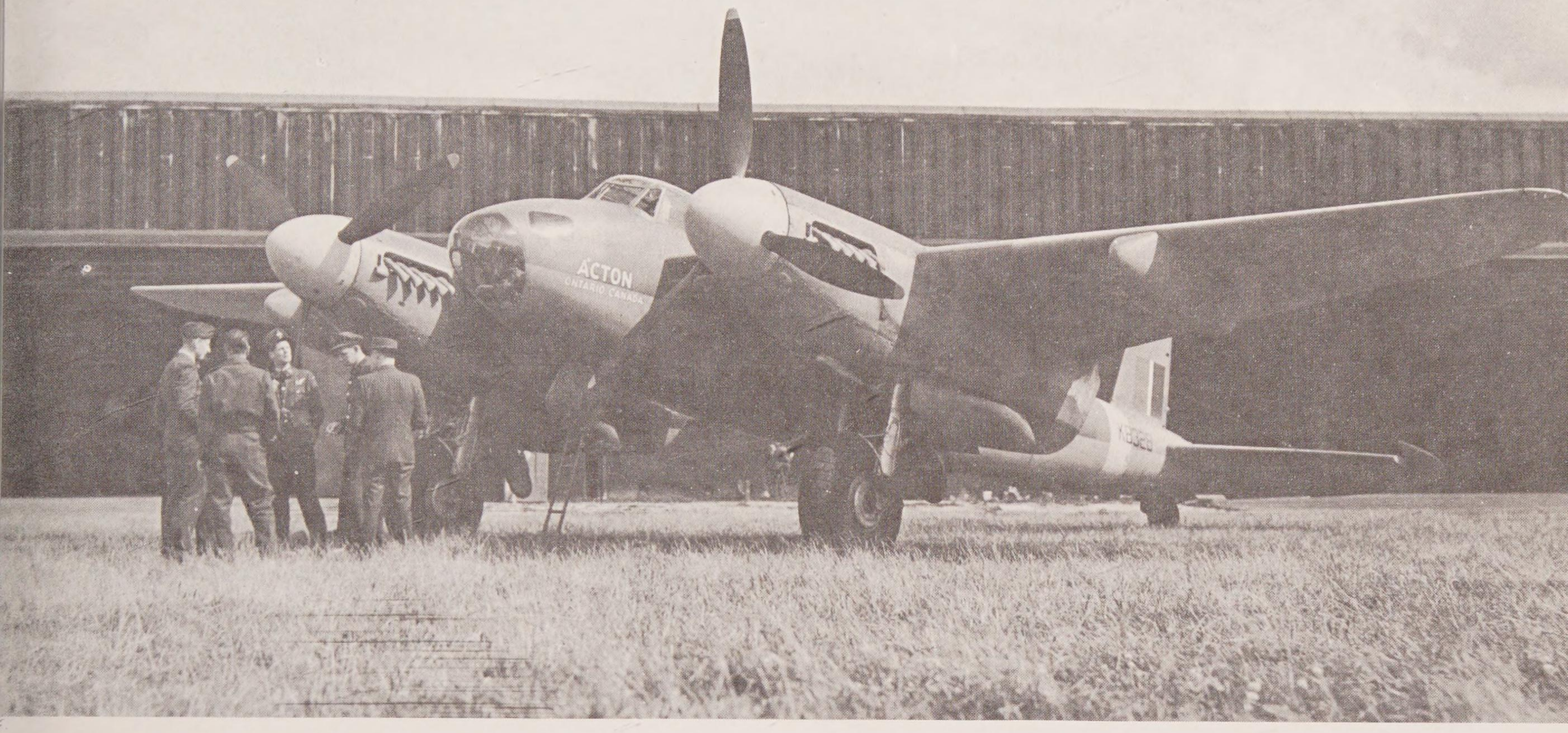
The night of January 29 was fixed for the sabotage, and at the change of shift the power house was cordoned off and a camouflage expert and illusionist named Maskelyne was used to set the scene. Part of the roof was removed by a controlled explosion, and pieces of transformer were scattered about, so that a German photo-reconnaissance aircraft "allowed" through the defences could record a scene of apparent heavy damge. The workers were told that a mystery explosion had occurred, but as no disruption was caused to the factory, it has proved impossible to trace anyone who remembers the event. A report appeared in the national press, but neither the company nor the location were divulged. Eddie Chapman, the wartime double agent now lives within about a mile of Salisbury Hall where the Mosquito was born.

The Percival Aircraft Company at Luton received contract 3047 for 250 B.IXs on May 4, 1943, while Hatfield orders were still growing. Mr Grinham returned to the motor industry in mid-May, having set up his track assembly system and many other production techniques at Hatfield. 71 aircraft were produced at Hatfield that month, with another 36 coming from Leavesden, and the combined cumulative totals reached 1,000 aircraft in the following month. By the end of November orders were approaching 5,000 aircraft in the UK alone; 2,548 from Hatfield, 1,544 fighters from Leavesden, 500 fighter bombers from Coventry and 250 bombers from Luton. The most prolific variant was the FB.VI, over 2,000 being produced up to 1946.

Although Airspeed did not really get under way with Mosquito production until 1946, they did manage to produce 12 FB.VI aircraft in 1945, and followed them with two batches of B.35s. Ron Clear joined the Empire Test Pilots School (ETPS) in March 1945, and one of his course projects was the investigation of Mosquito stability, using two Standard-built FB.VIs, RF644 and '648. He had to measure the static margins by plotting elevator angle against speed for various cg positions, and he succeeded in identifying the aeroelastic distortion of the fuselage and flexing of the tailplane. On returning to Airspeeds, this time with production at the better airfield at Christchurch, Ron flew VP178, the first of the B.35s, in March 1946, and continued on Mosquitoes until July 1948.

The first de Havilland aircraft to be built at Chester was a Mosquito NF.38 completed in September 1948. This fine factory had been built on Chamberlain's instructions during the Munich Crisis, and had turned out large numbers of Wellington bombers when Vickers took over the factory during the war. A few Avro Lincolns were assembled, and the factory was kept busy with pre-fabricated houses, urgently needed to provide temporary homes to the many people who had been bombed out. The 7,619th and last Mosquito, again an NF.38, was completed at Chester in November 1950.

# CANADIAN PRODUCTION



**One of the first two Canadian built B.MkXX KB328 "Acton, Ontario" on arrival at Hatfield on August 12, 1943.**

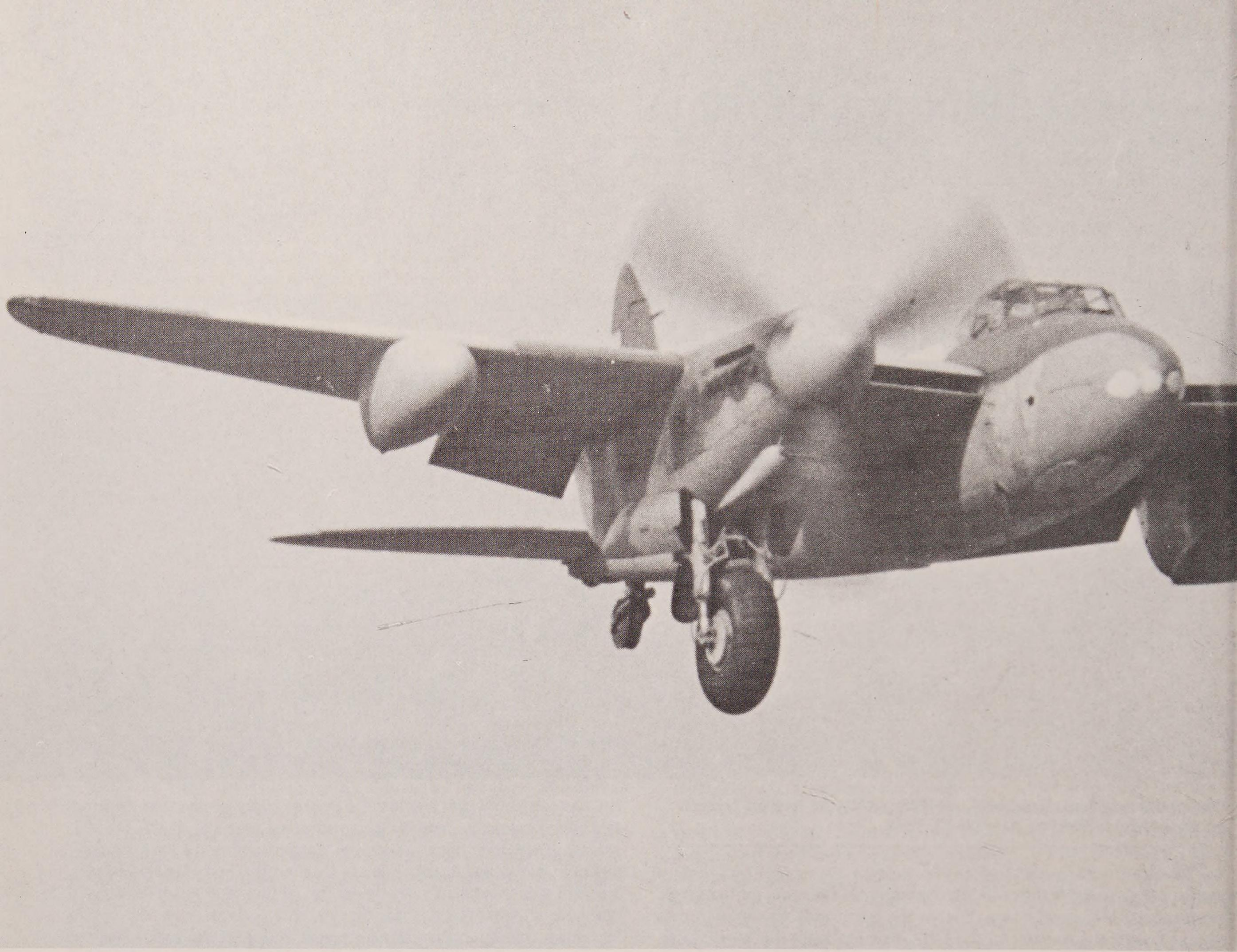
From the earliest days of the Mosquito it was planned that it would be a suitable aircraft for building in Canada, not only to supplement UK production, but, in the event of German invasion, to take it over altogether. In the USA Packard built the Merlin, the first two running in August 1941. Curtiss-Wright studied the possibility of building the Mosquito, but decided against it, and in July 1941 the decision was made to start Canadian production, it being estimated that 40 aircraft a month could be produced. The targets were set on two aircraft completed by September 1942 and 50 a month by 1943. The MAP were to place an order for 400 aircraft from Hatfield on Contract 555, and these would be immediately sub-contracted to de Havilland Canada. W. D. Hunter went out from Hatfield to take charge of design, incorporating local material specifications and equipment while still trying to maintain interchangeability. Harry Povey, the chief production engineer at Hatfield, went out to organise production at Downsview.

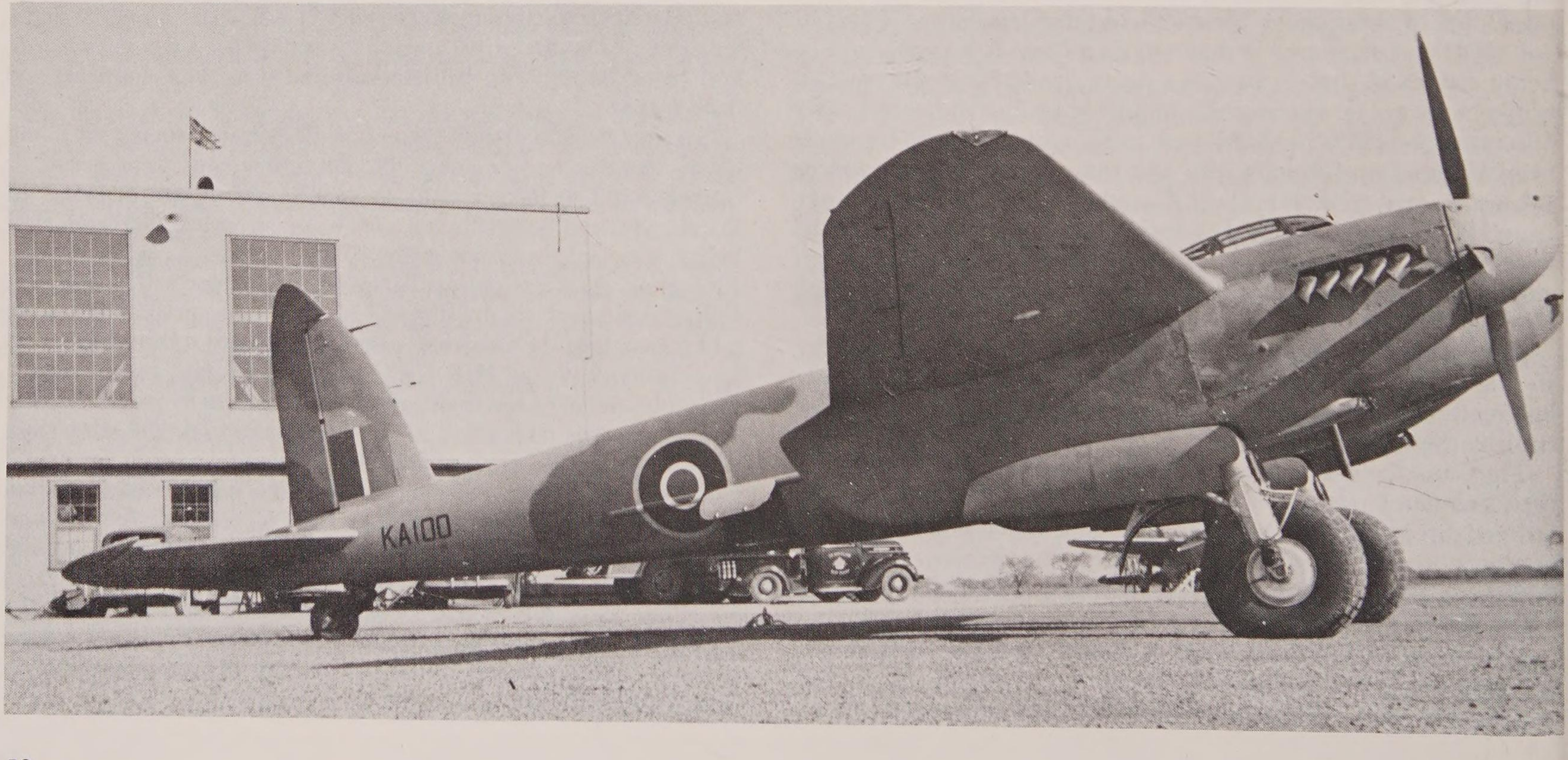
Many delays occurred in the shipping of drawings, jigs and parts. By the time the fuselage jigs arrived at Downsview the Canadians had made their own, so they were forwarded to Australia, only to be sunk by the Japanese en route.

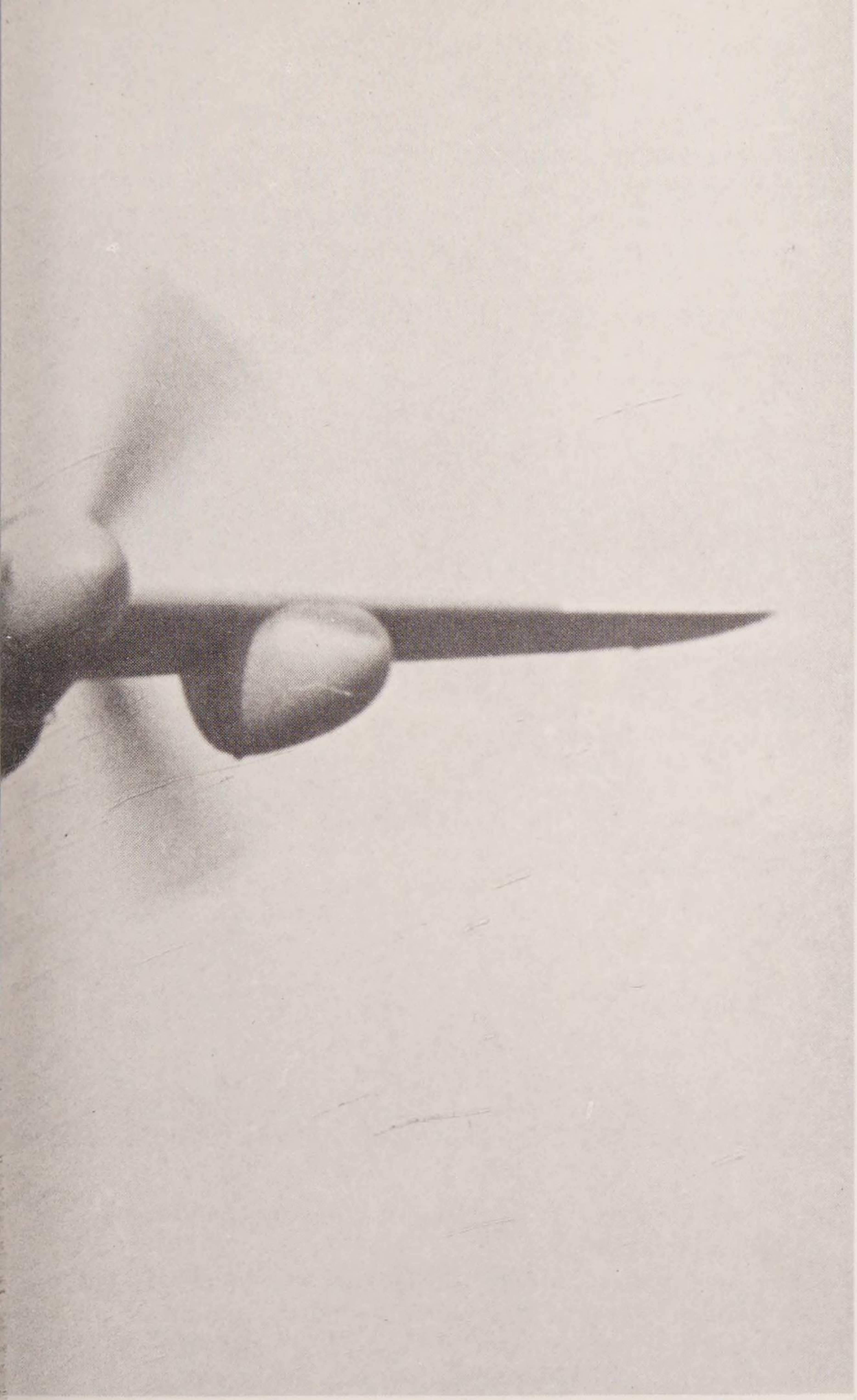
The Canadians were to concentrate on bombers for the RAF, but the Canadian Government wanted fighters, which they eventually ordered direct. De Havilland Canada production was allocated Mk. numbers in the 20 series, starting with the Roman B.XX. In addition a batch of 25 B.VII were delivered to North America, of which six went to the USAAF.

A number of problems were overcome by local adaptations; shipping out urgent details from Britain and re-designing to cope with local needs. The fuselage moulding jigs were produced in concrete, an idea that was later to benefit home production. In June 1942 the Downsview orders were increased by 1,100. B.IV, DK287 was shipped over from Liverpool on September 13 as a pattern aircraft, but it was rather late, as by then the first Canadian-built aircraft was practically ready to fly. When it was un-loaded at Halifax, it transpired that the pattern aircraft was damaged. However, on September 24, only a year and three days after Hunter and Povey had arrived at Downsview, Ralph Spradbrow, the chief test pilot at the factory took off in B.VII KB300 for its initial flight. Geoffrey de Havilland Jnr arrived three days later, flew the aircraft, and being happy with it, demonstrated it to the Canadians and Americans.

Geoffrey de Havilland returned to Britain in January 1943, and when Spradbrow was taken ill, Pat Fillingham went across to Canada on February 4 with an ex-PRU Mosquito pilot named Wooll, who had forced landed a Mosquito in Switzerland and, after being interned, was not allowed on operations again. George Errington, chief test pilot at Airspeed, also helped at Hatfield. Pat Fillingham spent six months in Canada doing production testing and instructing the Canadian pilots in the flight test schedule, and how to identify and deal with snags. Wooll had to abandon a Mosquito during a test flight, making his descent by parachute. Pat Fillingham was then asked to go to Australia to do the same tasks there following the death of John de Havilland. Pat spent over eight months there before returning via Canada, and ferried Canadian Mosquito KB221 back via Goose Bay, Greenland, Iceland and Prestwick. A number of Mosquitoes had been lost on this route, and while approaching the airfield in Greenland between the cliff faces on either side, the airfield became blanketed in cloud and the Mosquito had to divert back to Goose Bay. He arrived home on June 16, 1944, after an absence of some 17 months, to carry on production testing at Hatfield.




KA100



*Above.* **Canadian built T.MkXXII developed from the FB.XXI.**

*Left.* **First Canadian built Mosquito FB.21 KA100, similar to the British built FB.VI.**

Work on the fighter bomber versions started in January 1943. On January 20 it was agreed to send a sample T.III across to help Canada build their own trainers to train ferry crews bringing Mosquitoes to Europe and to convert RCAF pilots. A further ten stock UK T.IIIs were then released, as Downsview were becoming very occupied with their FB.XXI and the first 50 bombers were to be retained in Canada for Operational Training Unit (OTU) equipment. Delays were still caused by lack of specialised parts, which were not helped by similar shortages back home and a similar demand from Australia. By mid April only 17 Mosquitoes had been turned out at Downsview. Changes of aircraft role caused delays, and the change to formaldehyde cement for bonding and Tego-film plywood didn't help matters. However, as in Britain, these problems were gradually overcome by pure hard work and effort, and Downsview performance eventually compared well with Hatfield. Twelve months after the first aircraft flew, 67 aircraft had been completed and monthly output had reached 14. By mid-1943 92 had been completed, the majority being bombers. By mid 1944, 286 had been produced at a rate of over 40 per month.

The Packard-built Merlin 225s with 18lb boost were installed in the 271st aircraft, KB370, which became the first B.XXV and was accepted on July 7, 1944. The main fighter-bomber production variant in Canada was the FB.XXVI, with the Merlin 225s starting to appear in late 1944. The MkXXV was adapted in mid 1943 as the dual control T.XXII, the need for a trainer becoming urgent just when the fighter bombers could not be completed owing to a shortage of cannon and radios.

By May 1945 the Canadian overall total had reached 887, with monthly totals exceeding 80, and the aircraft were working well with the squadrons. The first two to be delivered to Britain, KB162 New Glasgow and KB328 Acton, arrived at Hatfield on August 12, 1943. By November five B.XXs were at 13 MU at Henlow, which was conveniently close to Hatfield. KB161 was issued to 139 Squadron at Wyton on November 11, and on December 2 the first operation by a Canadian aircraft took place when one bombed Berlin.

Ninety B.XXs were allocated from Canada to the USA as F–8s, and the 8th Air Force had 30 fighter bombers from UK production. Eleven F–8s were issued to 375 Servicing Squadron USAAF at Watton, while 139, 608 and 627 Squadrons and 1655 Mosquito Training Unit (MTU) in 8 Group were Canadian Mosquito operators.

By March 1945, total Canadian production had reached 728, and, by the end of May, of 887 aircraft built at Downsview, 430 bombers and 59 fighter bombers were in Europe. Some MkXXVs were prepared at Henlow for 614 Squadron in the Middle East, and the aircraft in service were clocking up a high reliable sortie rate. 162 and 163 Squadrons were using the Canadian aircraft, and some BXXVs were supplied to the RN for special duties, later going to the Middle East.

With the end of the war in Europe, the need for deliveries from Canada ceased, and many aircraft were left awaiting delivery at both Downsview and the despatch point at London, Ontario. 1,032 Mosquitoes were completed by VJ-DAY, August 15, 1945, and production ceased in October, when 1,076 was the final Canadian total. However, a good home was found for some of the stored surplus fighter bombers when 200 were shipped to China in 1947.

The Canadians had overcome massive problems to produce one seventh of the total Mosquito production, these aircraft playing a major bombing role when bombers from the British factories were in short supply. Canadian developments not already covered mainly concerned the trainers; the T.27 was a T.XXII with improved engines and the T.29 was a conversion from the FB.XXVIs.

**One of the Canadian built Mk.XXs allocated to the USAAF and designated F-8.**

# AUSTRALIAN PRODUCTION

**Australian built Mosquito FB.Mk40 A52-419 similar to the British FB.VI.**

Mosquito production by de Havilland Australia suffered all the problems encountered by the other groups compounded by a worse supply problem due to the greater distance from the parent factory and the lack of local industry, skills and materials to undertake large-scale aircraft production. Despite the many difficulties, including the fact that many of the parts would have to be supplied direct from Hatfield, the Australian Government instructed de Havilland Australia to build Mosquito fighter bombers for the RAAF. An F.II, DD664, was shipped out as a sample aircraft and, as with Canada, a number of Hatfield specialist engineers were seconded to Australia to help get the programme under way. It was certainly fortunate that the USA didn't participate in production, as a further spreading of material, equipment and man-power resources would almost certainly have caused an overall drop in production. The number of aircraft to be produced in Australia was much smaller, as they were only supplying their home market and it was neither practical nor necessary to try and supply Britain as well.

It was intended to fly the first Australian Mosquito by August, 1943, the aircraft embodying a high proportion of imported equipment and material. In July 1942 much of the vital drawing information reached Sydney, allowing detailed engineering to commence, but the aircraft, re-identified as A52–1001, did not fly until December 17. The demand for materials and parts from Hatfield grew and although 95 per cent of these were no great problem, the last few per cent were critical and sufficient to prevent the aircraft's completion. A new factory was constructed, and by
May 1943 the delay in obtaining machine tools and finding sub
contractors was clearing.

The Australian company, like Canada, was allocated a batch o
mark numbers, this time in the 40s. The first Australian aircraft wa
FB.40 A51–1, which was flown by Wg Cdr Gibson Lee, the D.H. tes
pilot, on July 23, 1943. As already mentioned, John de Havillan
was to set up the Mosquito production flight testing organisatio
but with his death Pat Fillingham was sent on from Canada, flying
long and tortuous route across the Pacific in the bowels of
transport Liberator and arriving at Sydney on October 19.

The shipping of components for the Sydney production lin
generally built up very well, with far fewer losses to enemy actio
than anticipated. To avoid diffusion of effort, as with Canada, a tot
of 14 T.IIIs were shipped out, arriving towards the end of 194
They were sent without engines as the Australians had a supply o
Packard Merlin 31s which were fitted into the airframes on arriva
The change to formaldahyde glue caused problems, as it had i
Canada, and the shortage of skilled labour was always a problem
The first delivery to the RAAF was made on March 4, 1944, but th
follow-up was slow, because of glueing problems between the top o
the spar and top wing skin. To cure it, modifications had to be mad
to all the wings built up to that time, and the 50th was in the fin
assembly stage. With over 20 aircraft complete, or nearly so, th
effect on deliveries was disastrous.

The Mosquito FB.40 A52–12 crashed fatally on a pre-acceptanc
test flight when the wing failed. Although the glueing was suspec
the cause was found to be flutter at high speed and high g. Pa
Fillingham later talked about the effect of compressibility, whic
may have been reached by Mosquitoes at high speed and would no
have been understood at the time. There were rumours that Spitfi
pilots came across this problem, and as the Mosquito was faster

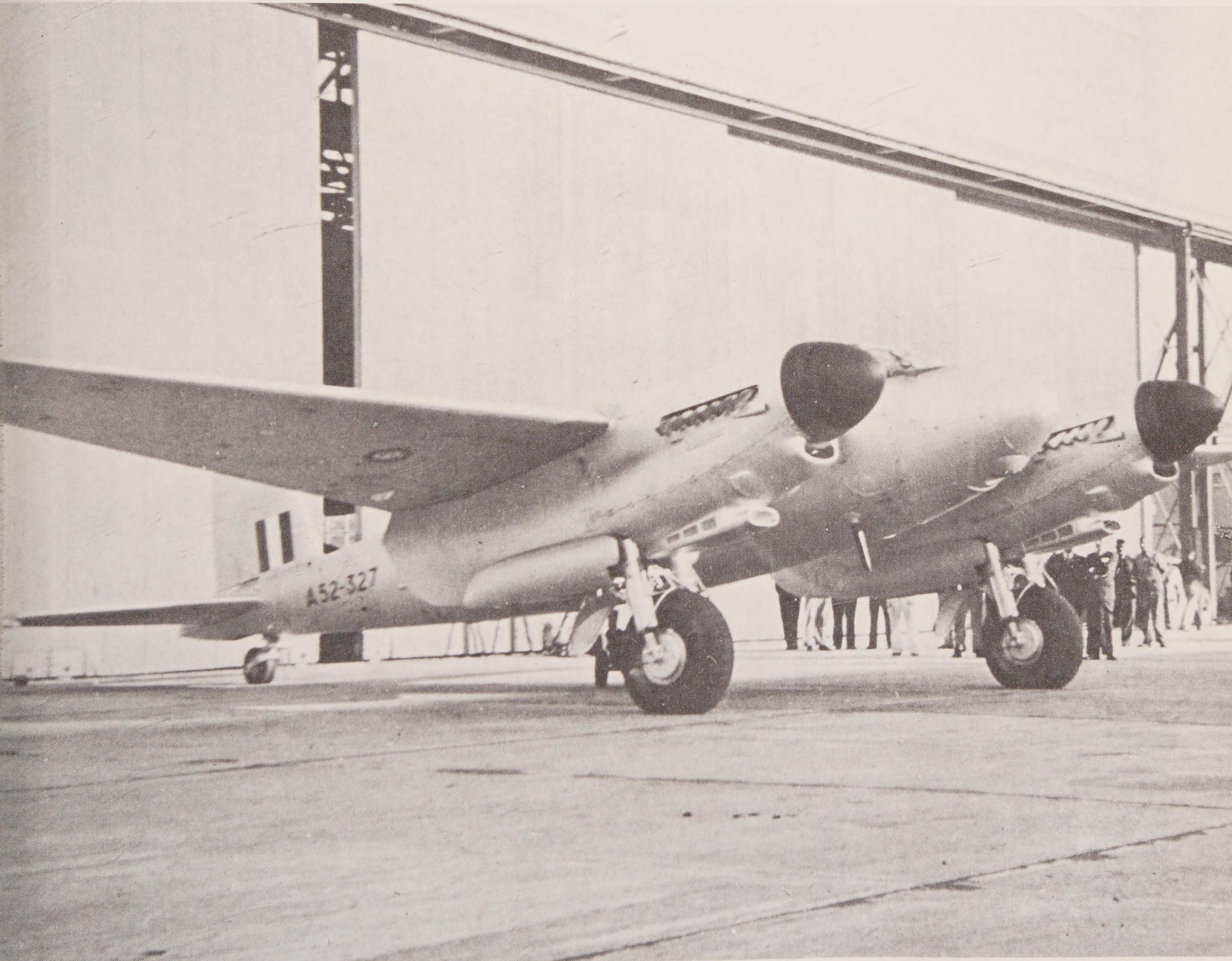
can be reasonable assumed that in a dive to escape an enemy compressability may have been experienced. A modification was introduced to cure the wing flutter, but it seems odd that this problem remained apparently undiscovered until the aircraft was being built in a third country. It is possible that local conditions were partly to blame.

Deliveries were then slowed down by another crash, this time to FB.40 A52–18 at Bankstown on November 8, 1944. The aircraft was under severe manoeuvring loads at the time, but despite a check of the glued joints and investigations of flutter, aileron balance and torsional stiffness, no obvious cause could be found. Experts travelled to and fro between England and Australia, finally coming up with a variety of explanations at the end of May. By this time the outcome of the war in Europe was a foregone conclusion, but the Japanese threat was still very real down-under. From March 1944 to May 1945 the production rate built up to about 12 a month, with total deliveries at 75 aircraft. When Japan surrendered on August 15, 108 had been produced, and Australian production continued to a total of 212 aircraft. By that time, the basic aircraft and many of the special parts were being produced locally.

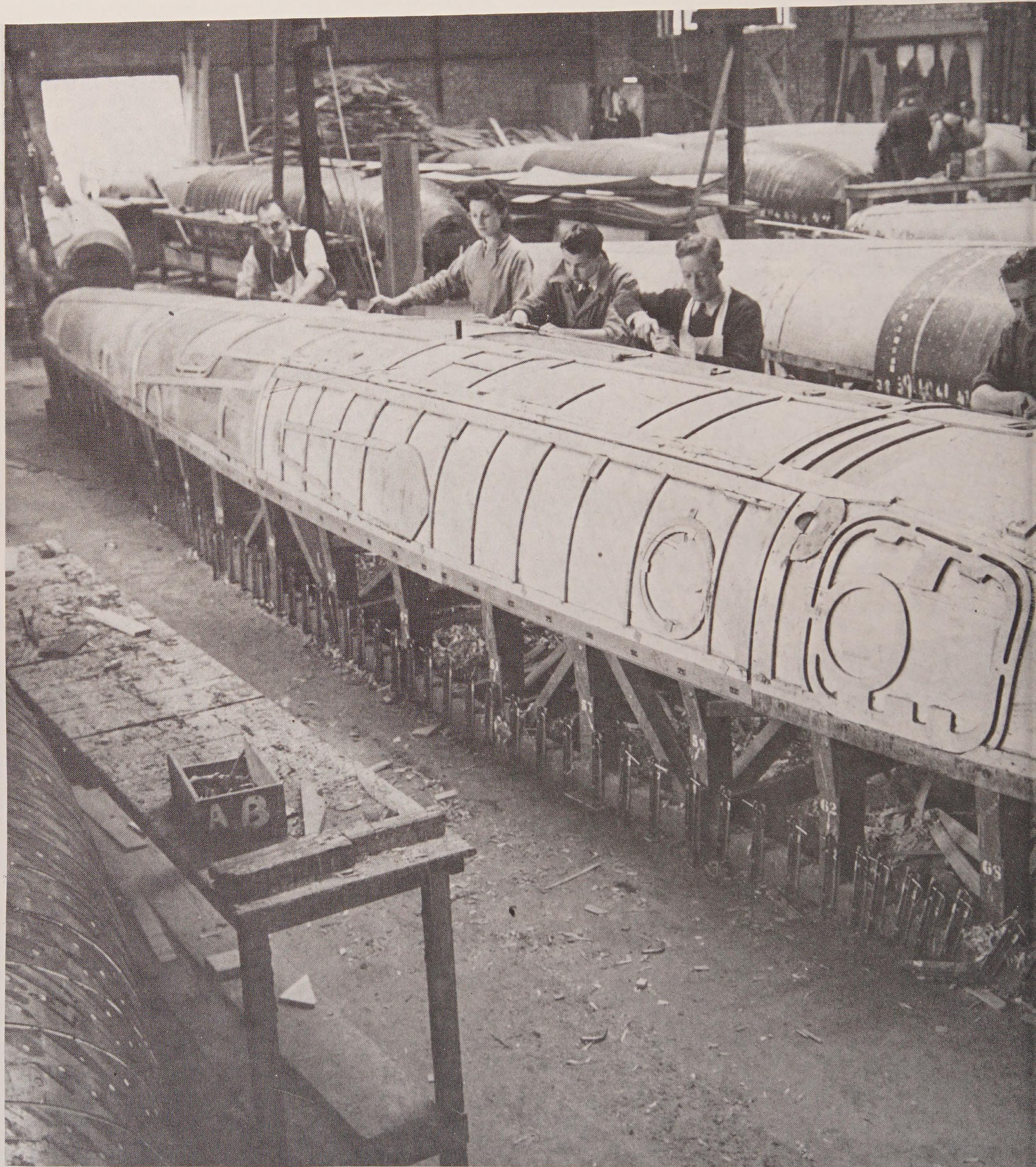
Local variants included the PR.41 powered by a pair of two-stage Packard Merlin 69s, 28 being delivered between May 1947 and July 1948; the FB.42, of which only one was built, A52–300, powered by the Merlin 69s; and, finally, a batch of 21 T.43s similar to the RAF T.III but powered by the Packard Merlin 33, converted from FB.40s and delivered between June 1944 and May 1947. In addition to the RAF T.III supplied, 23 PR.XVIs and 38 FB.VIs were supplied from RAF stocks. The PR.XVIs were used by 87 Squadron RAAF and the FB.VIs by 1 Squadron.

Post war the PR.41s were used for a much-needed large-scale photographic survey of Australia, which lasted until 1953, and some of the surplus aircraft were acquired by the RNZAF. An FB40 and a PR41 were entered for the England to New Zealand air race in 1953, but one ditched in the Indian Ocean on the way to Britain and the other did not compete.

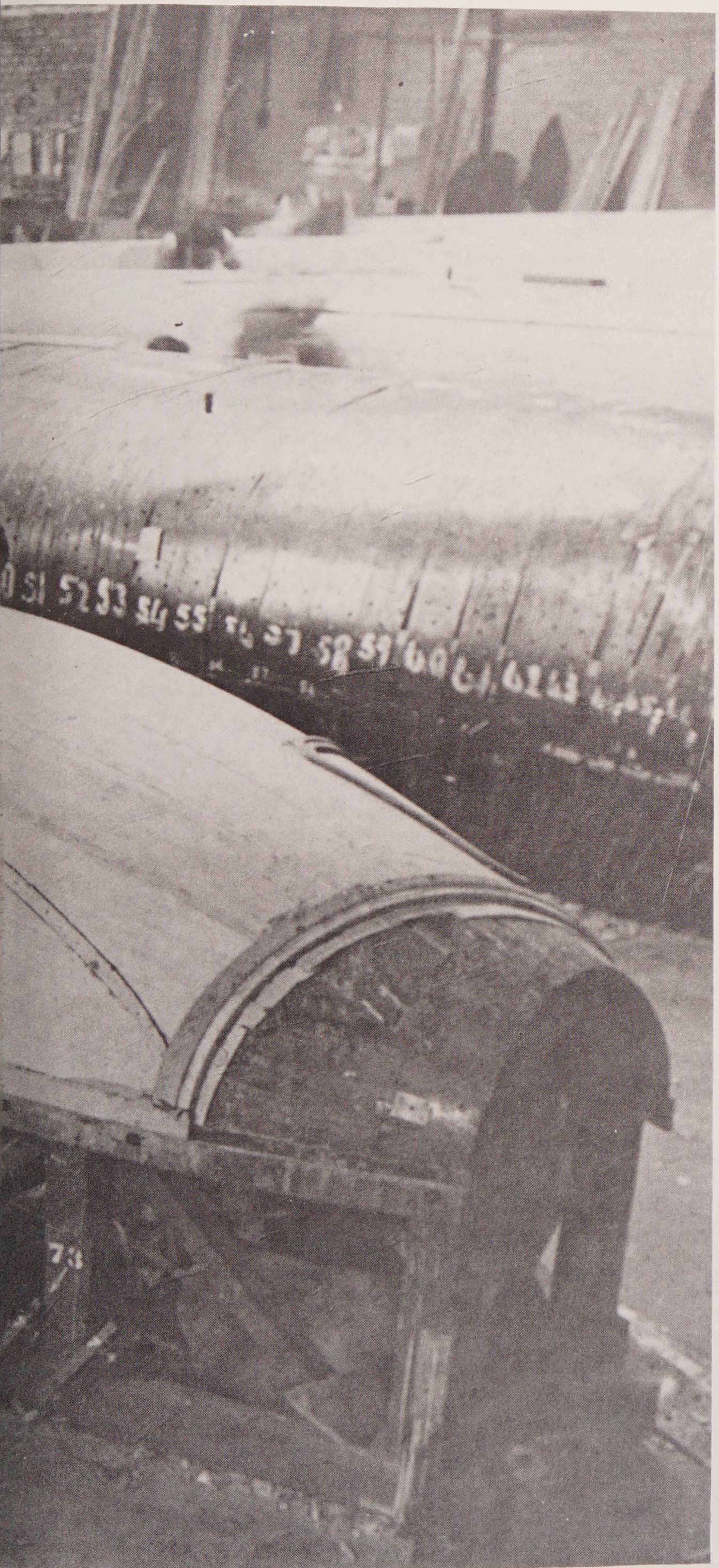
**The last Australian built Mosquito was PR.41 A52-327 delivered on July 22, 1948.**



# BUILDING THE MOSQUITO



**The moulding of a half fuselage shell, the nearest one showing a half bomber fuselage with the crew entry door, bomb door and other cut outs, before the outer sheet of ply is laid across. Behind are completed shells with the metal strips holding down the wood while the glue sets.**



Mention has already been made of the construction of this remarkable aircraft, but at the risk of being repetitive a more detailed description follows. The Mosquito was unique in that it was the only modern, all-wood front-line aircraft to enter service in World War Two. De Havillands had exceptional experience in this form of construction, although they had turned to all-metal construction for the immediately pre-war Flamingo airliner. However, a wooden structure could be built quicker than a metal one, using non-strategic material and labour, general repairs were very easy and damage tended to be localised. Produced by a company not accustomed to building high performance military aeroplanes, the aircraft entered service less than two years after commencement of design and was the fastest operational aircraft in the world.

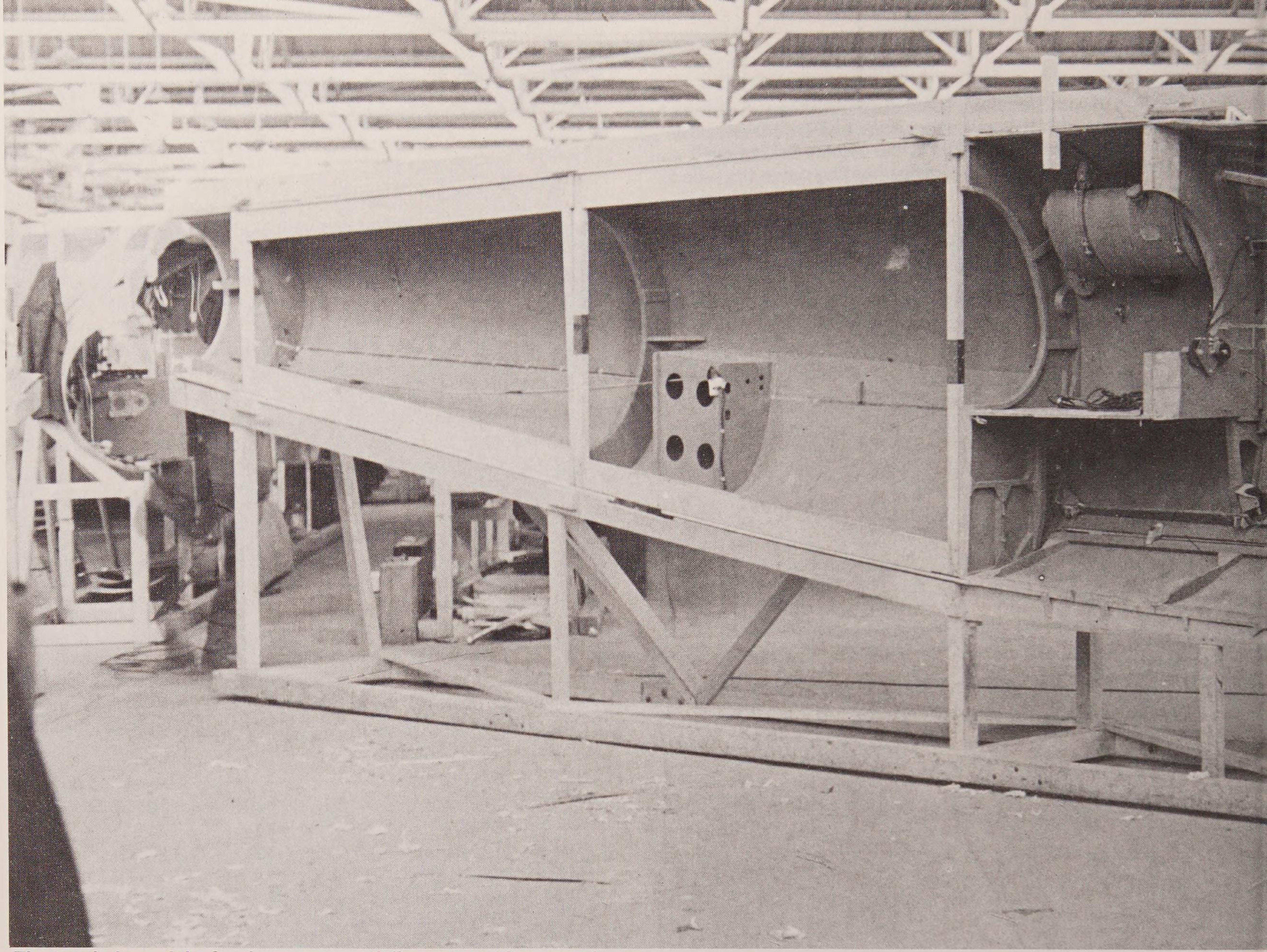
The fuselage was constructed in two halves, joined along the vertical centreline. Each half was built in a horizontal position with the centre downwards, the shape being formed over mahogany moulds at first and later over cast moulds in smooth finish concrete. The various sections of the mould had studs set in them and were mounted on a frame, the bulk-heads fitting in the gaps. Neither heat nor pressure chambers were used to shape the thin ply, 1.5 and 2mm thick, which formed the inner skin and was spread over the mould. Spruce structural members were then located in position and the areas between in-filled with 3/8in balsa wood blocks to fill the sandwich. The outer ply skin was then applied, closely-spaced flexible steel-band cramps being used at each stage of assembly to provide the forming pressure during bonding. Various other wood fittings other than the bulk-heads were located on the inner skin by slots in the moulds. Bomb doors, lower side panels and entry doors were made integrally and later cut out, and the main wing attachments were also moulded in.

On removal from their moulds, the two fuselage shells were held on vertical cradles ready for the detail assembly. To make the fitting easier, ferrules were used, consisting of plywood discs mounted on wooden plugs, in which a threaded brass bush was set to pick up the attachment bolts. To mount these ferrules holes were drilled in the inside fuselage skin, using special templates, to sufficient depth to take the plugs without breaking the outer skin.

As much of the interior equipment and fittings as possible were installed while the fuselage was in two halves, including floors, control linkages and the first of the wiring. Systems were separated to assist this process, most control cables being kept to the port side and hydraulic piping to the starboard side. Interior spraying of paint was also done, leaving about 40 per cent of assembly remaining after the join of the two portions.

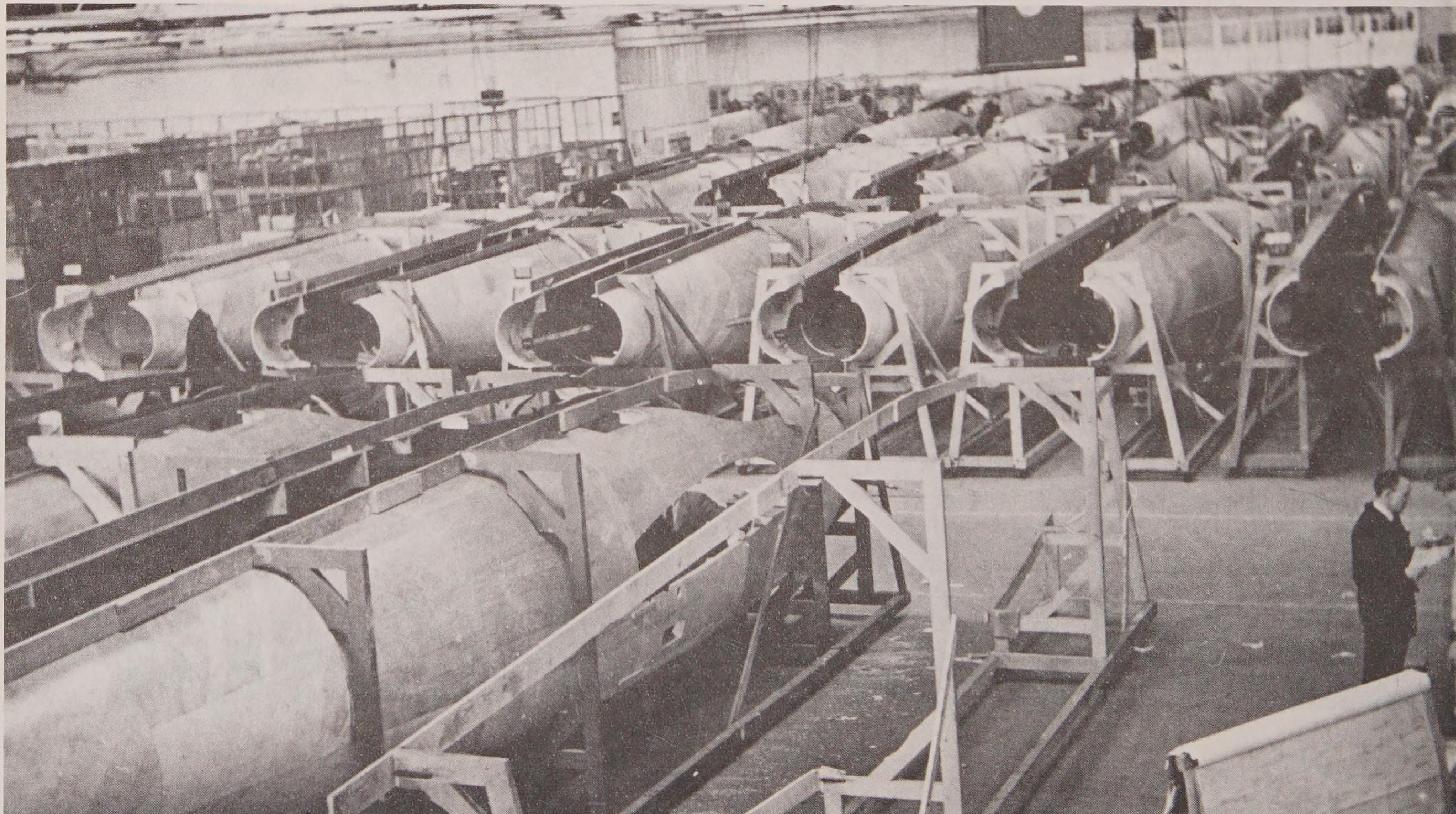
The "boxing-up" of the fuselage was done by a V butt joint of multi-ply spruce, reinforced by plywood strips in rebates inside and out. While the adhesive was setting laminated wood "O" clamps held the rear fuselage and trunnion mountings in the centre section located on the wing attachment fittings. Great care was taken to bring the halves together accurately and avoid distortion and twist. To prevent the fuselage centre section cut-out from distorting or breaking its back before the wing and side panels were fitted, a jury strut was fitted.

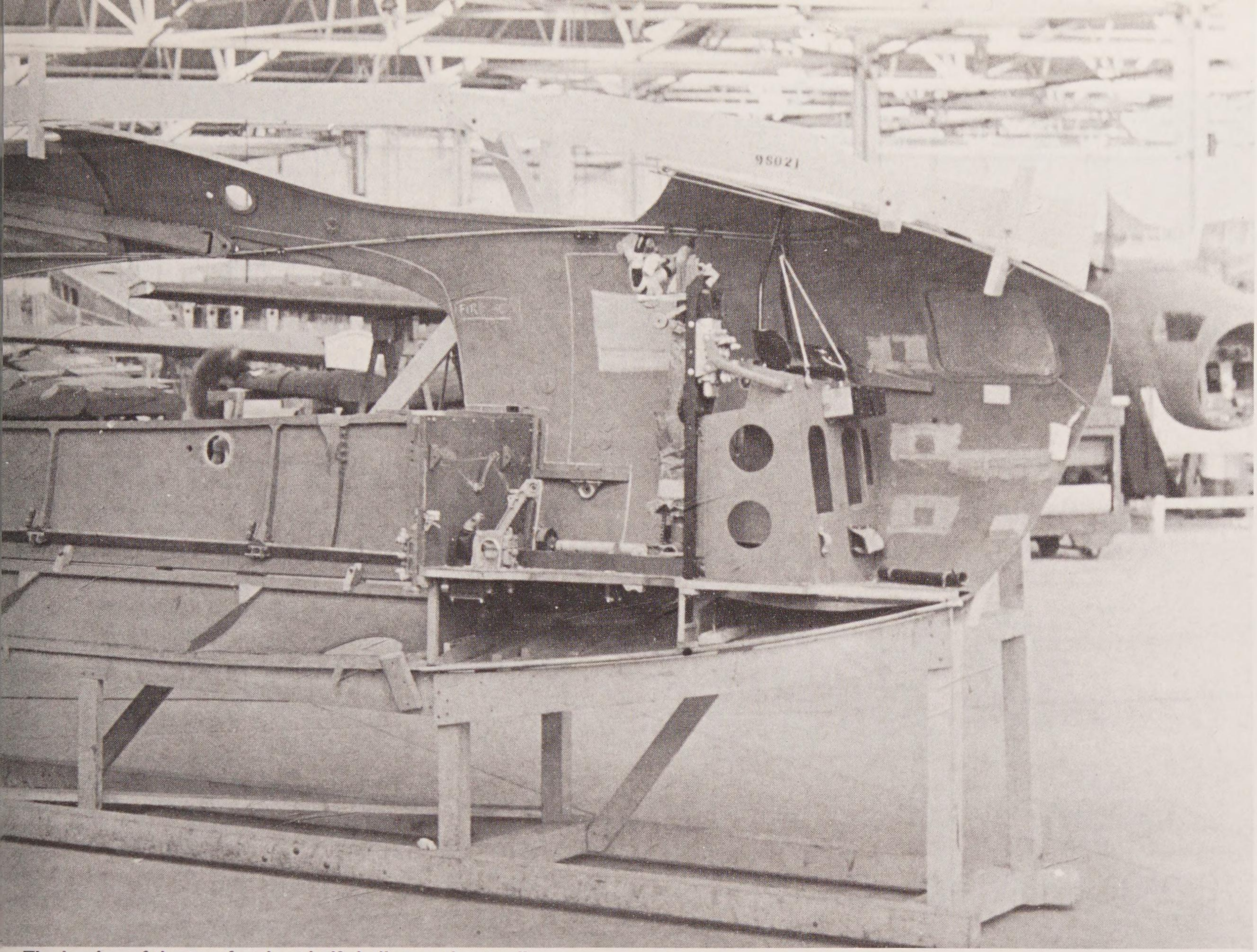
Once the two shells were joined, the fitting-out continued with the instrument panels, plumbing and wiring. Bulkheads numbers 6 and 7, carrying the fin and tailplane attachments, were then fitted at the tail end of the fuselage, followed by the tailwheel retraction jack. The cockpit canopy was then attached and the final stages of



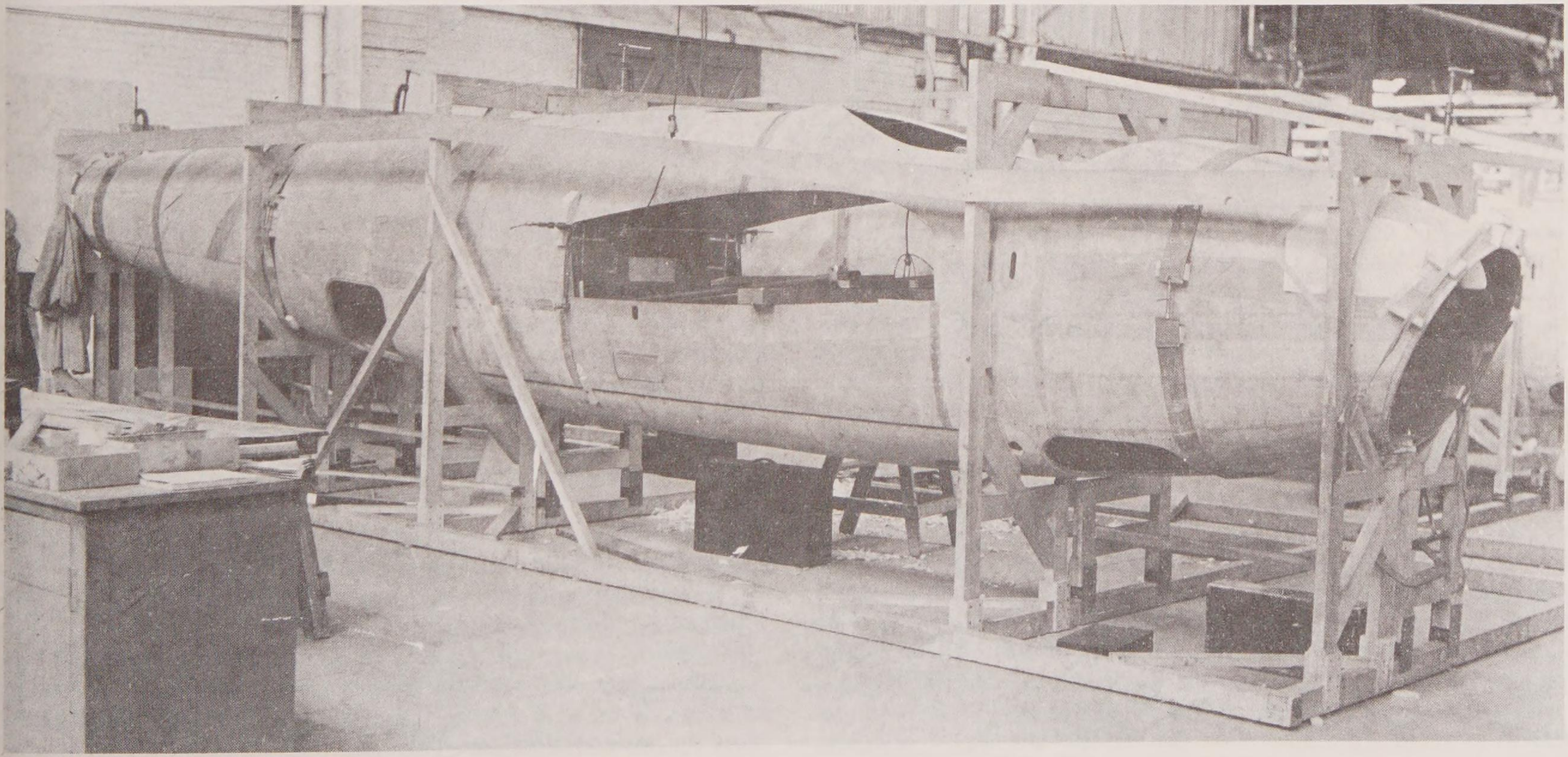
The two halves of the fuselage were partially equipped for ease of access before joining down the centre lines.

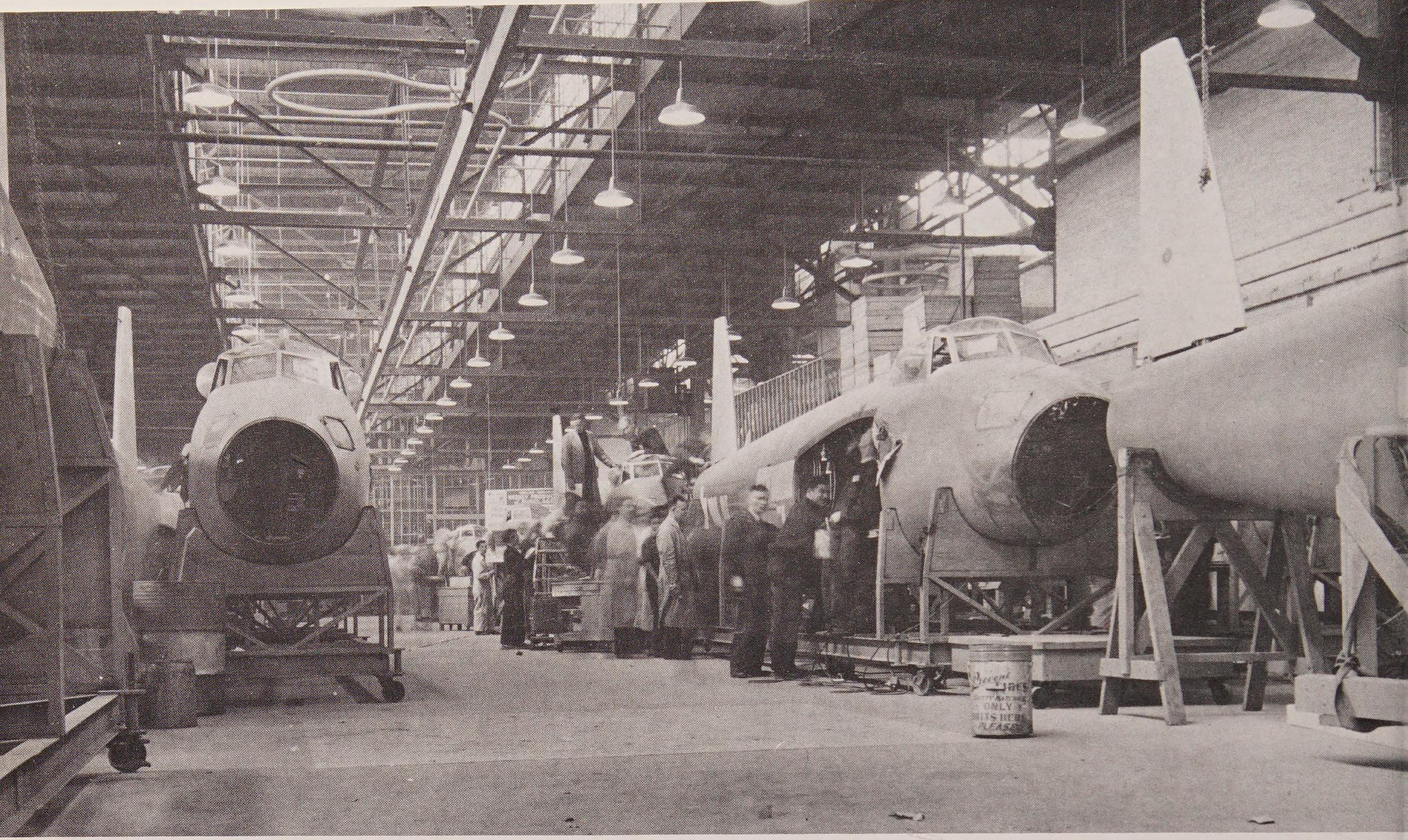
The fuselage shop with shells ready for joining. *IWM*





The boxing of the two fuselage half shells together to allow equipping to continue. The bomb doors and side panels were removable to allow the fuselage to be lowered on to the wing.





**Bomber fuselages being equipped after joining of the two halves.**

installation of equipment and services were completed. All the external wood surfaces were doped and covered in madopolam, a thin fabric which helped to weatherproof the wood. All cut-outs were also doped and covered with fabric to avoid water seepage. The stability of supported plywood structure gave the bonus of similar tensile strength to light alloy, but in compression and shear it was far superior.

The wing was a one-piece assembly from tip to tip, with a marked taper to the trailing edge, and a slight taper to the leading edge, giving a distinctive plan form. It was a conventional two-spar structure with a stressed ply skin unusual for a wooden construction which reduced the number of wing ribs to a minimum. The plywood skin was reinforced by closely-spaced, square section stringers of Douglas fir which, in the case of the top skin, were sandwiched between two layers of ply stabilised by balsa strips in the gaps. On the undersurface only one outer layer of ply was used. The main fuel tanks were housed in the inboard areas of the wing, accessible through stressed balsa plywood sandwich construction tank doors which were bolted around the edges.

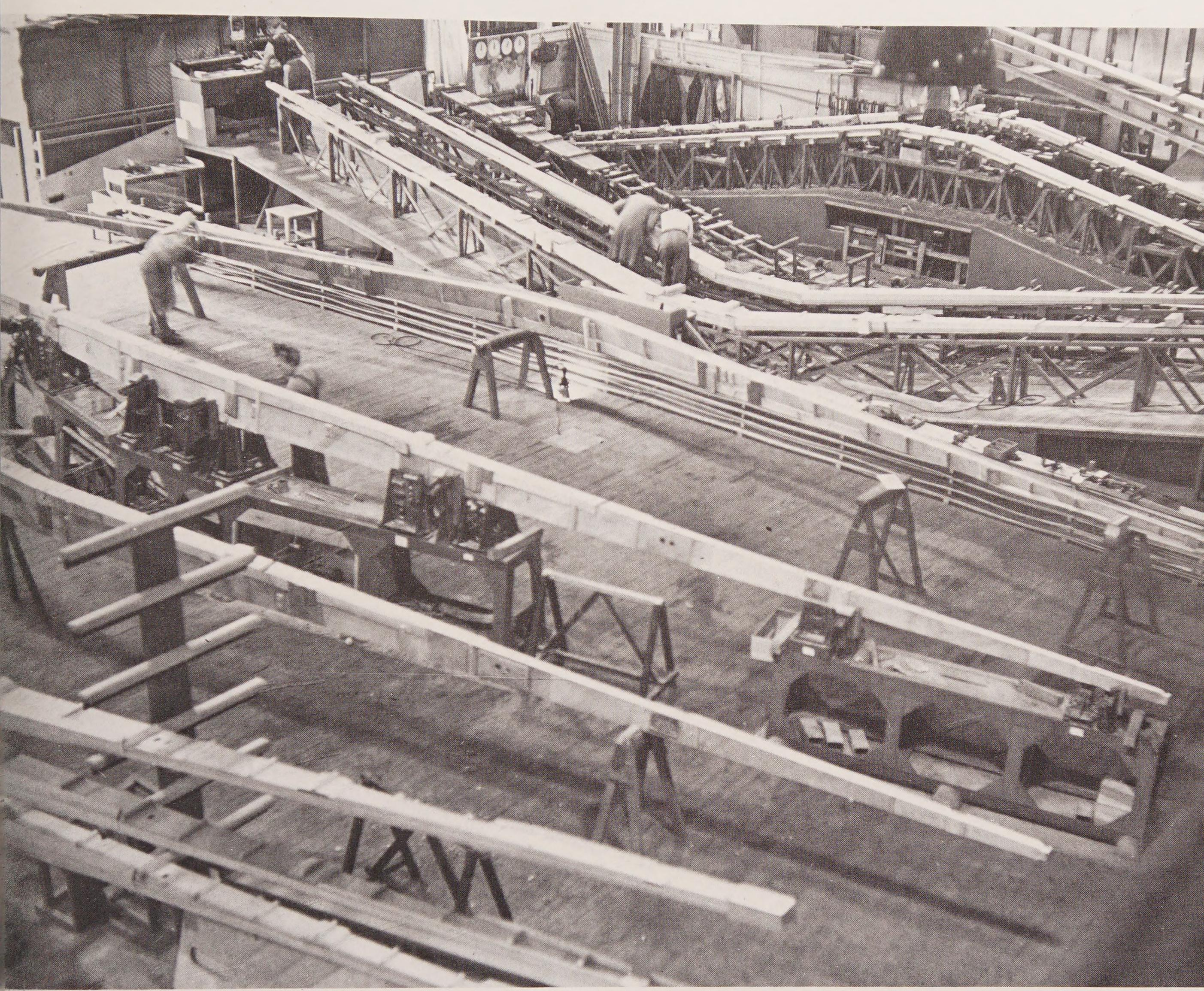
Both main wing spars were of box construction with laminated spruce booms and plywood webs on either side. The front spar was a conventional straight member, but the rear spar was formed to follow the forward sweep of the trailing edge. An additional complication was the combination of dihedral and the forward sweep. Each complete spar was more than 15m (50ft) long, the rear spar booms being built up from a centre-section, with the outer portions and tip extensions all scarf-jointed and glued together.

The spars were made up of laminations cut to an accuracy of 0.01in to avoid adjustment after sawing, and the slightly rougher finish helped in the bonding of the joints. These spar laminations were each 0.4in thick, although the top boom was originally made up of laminations 1.45in thick. The thicker laminations demanded a higher quality of wood free from faults, so to make best use of available material the thinner laminations were adopted. To save weight where possible, recesses were spindled in the booms. Although the booms were rough-finished by overhead planers, they were not accurate enough for final finishing, which had to be done by hand planing and checking by straight edges laid across datum blocks on each side.

The plywood spar-webs were made up from short lengths, routered to shape and drilled in batches of two or three at a time, using hand drills guided by drill bushes mounted on wooden templates. The complete web was made by scarfing the shorter lengths of plywood and bonding them under the pressure of clamps.

Assembly of the spars was done on large fixtures, that for the rear spar having sloping access platforms. The booms were trimmed to length in the fixture to a tolerance of 0.020in on each side, located in the jigs and the webbs bonded and screwed down to complete the assembly, the screws providing the necessary clamping. To accelerate the setting time, during which no other work could be done, a complicated system of thermostatically-controlled heating was devised to an accuracy of + 1½°F over various sections of the spar. The rib posts were also bonded on at this stage. On completion of bonding the spars were placed in the drilling jig, where all the holes were drilled for the metal fittings, such as undercarriage and aileron hinge brackets, using bush plates as guides.

The skins were produced in a similar way to the spar webs but on a larger scale, the various sections being scarfed and bonded together. For assembly, the stringers were located in metal-faced slots on horizontal tables. The pre-drilled and countersunk skins



**Front and rear main spar assembly. The front spar was straight, but the rear spar was a rather more complicated swept forward shape.**

were bonded and screwed to the stringers, the screws again doubling as clamps and being fitted using pump screwdrivers. After assembly and cutting out of access panels. the outer surface was sprayed with red primer dope and the inner skin with white damp-resistant cellulose paint. The skins were then ready for assembly with the wing.

The wings were assembled in large, paired-up, vertical fixtures, open on both sides. The completed spars were located hard against double wedge hardwood blocks, which could be knocked out to release the wing on completion. The spars were positioned in the jig with the front spar downwards, located on the engine bearer fittings on the front face. The rear spar was located by the undercarriage radius rod attachment brackets. With the spars firmly located, the 32 interspar ribs were fitted, the inner ones being of box section, and the outers having a single plywood web. The heavier, load-carrying ribs were bolted to the spars, while the others were glued and screwed in the centre area or glued and tacked to the rib posts nearer the wing tips.

Skin assembly commenced with the bottom skin, which extended outboard from rib 6, the inboard area comprising the fuel tank access panels, engine nacelles and main undercarriage bays. Attachment was by the usual glueing and screwing. Next came the inner top skin with the stringers mounted on its outer surface, the attachments to the spars and ribs being drilled off using templates in the inner shell, which was offered up temporarily. The spar and rib booms were counterbored to depth for attachment screws, the shell skin being used as a jig. The stringers over the centre-section were joined to the outer stringers by tapering them and scarfing them together, the bonded joint being held by a number of small wedge clamps. The entire assembly was dry-fitted before bonding and screwing.

Esavian at Stevenage were one of the sub-contractors who built Mosquito wings, their workshop containing the double sided assembly jigs with the wing held vertically, leading edge down.

NO SMOKING
NO SMOKING
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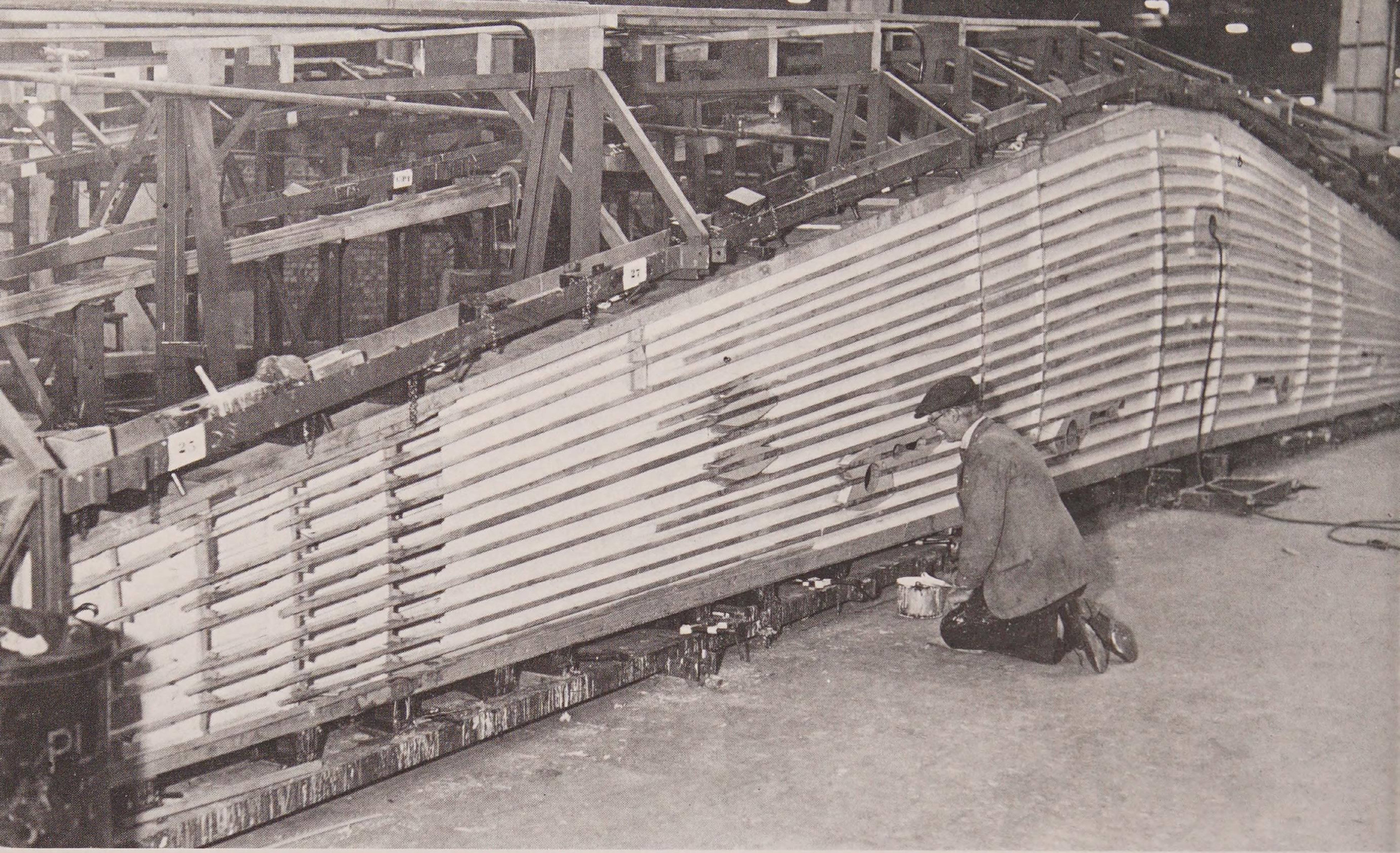
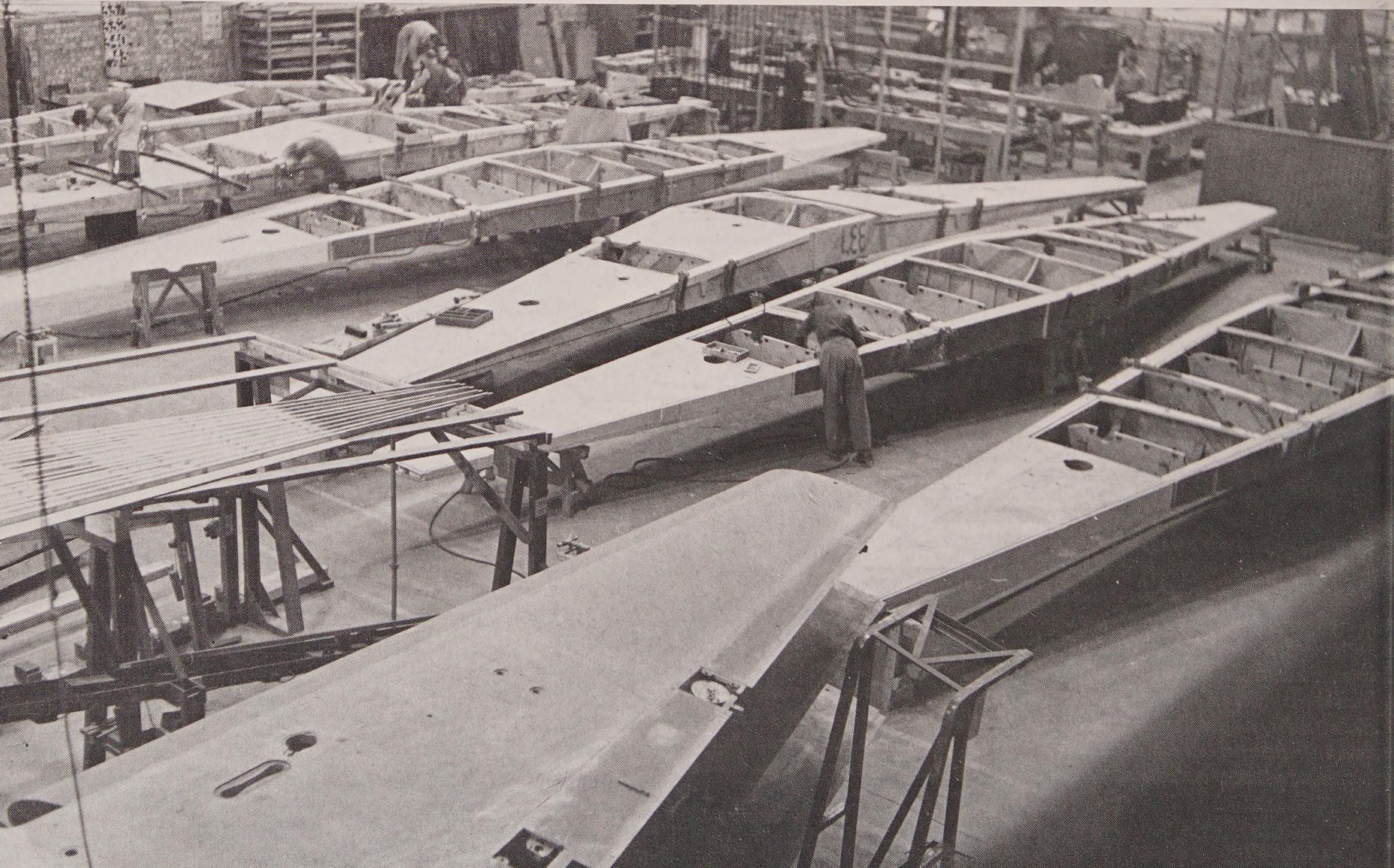
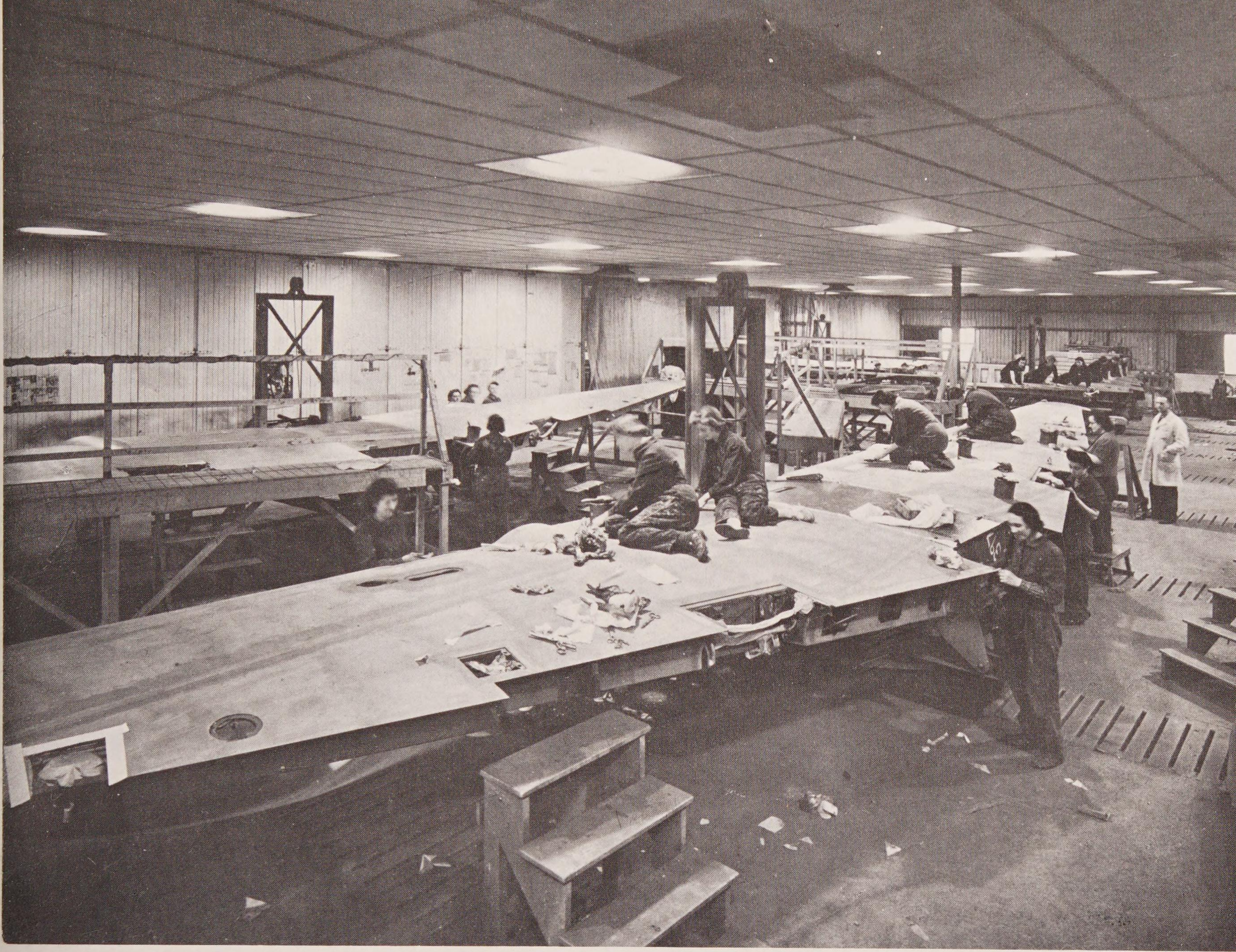


The wing top skin being prepared for the glueing of the outer skin, on assembly to the stringers.

Wings removed from the assembly jigs. The inverted ones are ready for the fitting of the fuel access panels, while the nearer wing has the leading edges and shrouds fitted.





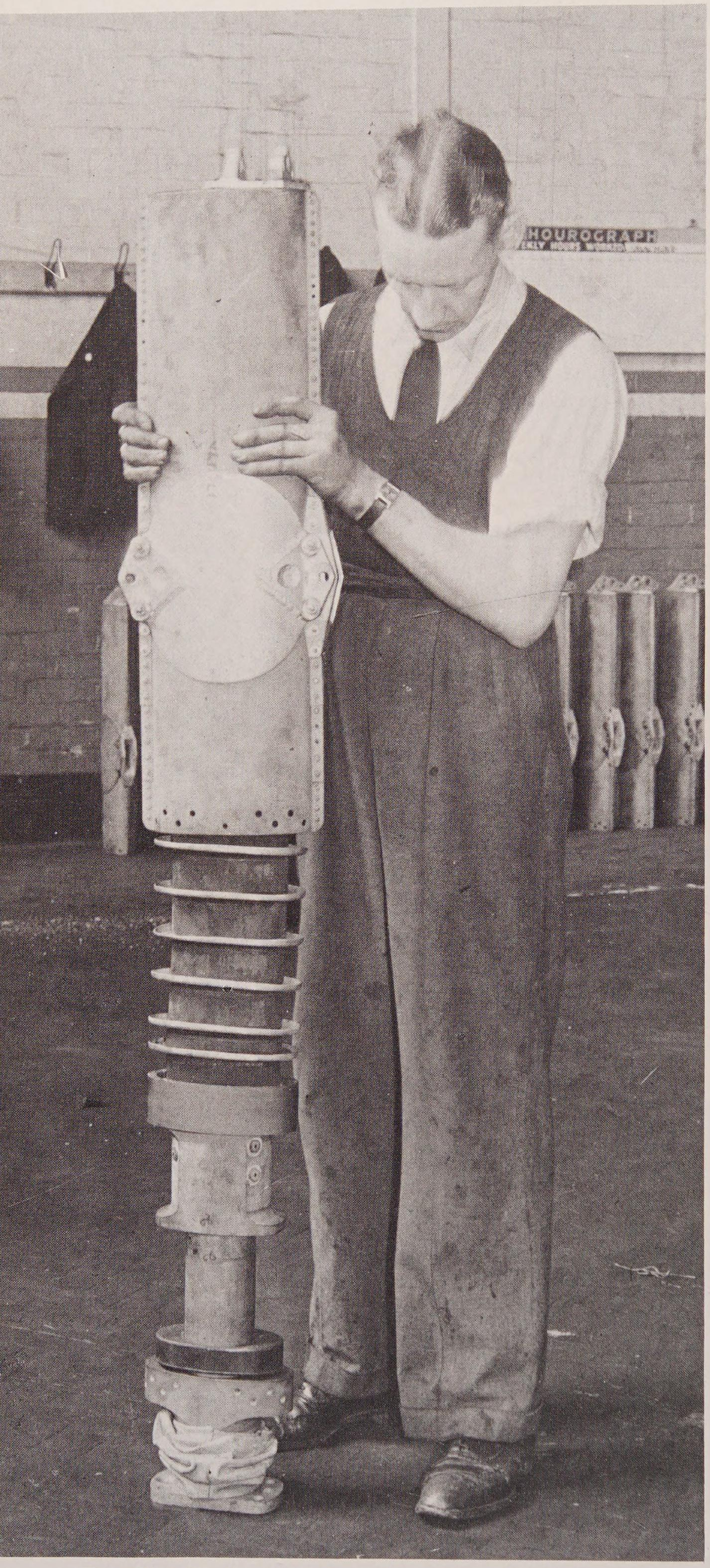
**The wings were doped and covered, mostly using female labour.**

Water-resistant cellulose was then applied to the inner shell, and the top surfaces of the stringers were prepared for the top skin, which was in three panels. pre drilled for attachment to the inner shell. The inside face was coated with the adhesive, both for bonding and damp proofing, and the skin was offered up to the wing structure by a gang of men and screwed down. Additional pressure was applied by clamping battens. From rib 1 to rib 6 anchor bolts were inserted right through the skin and inner shell into the rib booms. Finally, walnut mounting pads were attached over the two No 1 ribs for the forward fuselage pick up.

When all the countersunk screw heads had been filled with stopping compound the wing was ready for removal from the jig. This was done sideways, on special wheeled stands which allowed the wing to be lifted away by crane and lowered on to cradles, underside up, for the fitting of the leading edge, flap and aileron shrouds. The stressed tank covers were also fitted, along with the remainder of the undercarriage fittings and the wing-to-fuselage pick ups. The leading edge was a preformed plywood skin with supporting nose ribs. This and the shrouds were glued and screwed in position and clamped by canvas bands over the wing. Slave ailerons and flaps and their brackets were installed to check shroud clearance.

Engine and radiator fairings were fitted next, as were the control cables, ready for connecting up. The wing was then taken to the dope shop, where the surface was red-doped, covered with madapolam and camouflaged prior to the installation of the electrical and hydraulic systems. Following the installation of the fuel tanks the wing was ready to join the final assembly line, where the detachable wing tips were fitted.

The tailplane and fin were of similar construction to the mainplanes, the fin being set slightly forward of the tailplane. The structure of each was based upon two spars, the rear one being a one-piece straight member, as, unlike the wing, the tail members were curved back at their leading edges. Ribs and nose ribs completed the structure, the tailplane being built in one piece like the wing, but on a smaller scale, starting with the leading edge. Its overall length had to be closely controlled to allow adequate clearance for the elevator horn balances after assembly. The trim tab attachment and hinge brackets were fitted to the rear spar before it was assembled in the jig. The skin was a single-layer covering on each side, scarfed together from smaller sections with handholes and inspection apertures cut out before assembly, the skins being bonded and screwed to the structure. After the application of the first skin, the metal fittings were bonded on and the interior waterproofed. The surfaces were then doped, madapolam covered and painted.



**The rubber block main undercarriage assembly was simple and effective, without complicated machining.** *Aircraft Production*

The flaps were of wooden construction covered in ply an comprised inboard and outboard sections on either side of th engine nacelle, joined by a torque tube to form a single unit. Th torque tube was also in two portions, joined in the centre by cranked fitting to pick up with the flap-operating hydraulic jack The flaps were of conventional construction with a nose section single spar and ribs to the trailing edge. The interior was damp proofed and the finished assembly doped, covered and painted.

The rudder was a conventional, fabric-covered metal structure and the elevators and ailerons were conventional metal-covere metal structure. The elevators were horn-balanced, while th ailerons had internal balances in their leading edges.

Another interesting and unusual assembly was the main undercarriage, which used rubber blocks in a tube for shock absorption This method was uncommon in an aeroplane as large as th Mosquito, normally being used on lighter aircraft. However, severa advantages were claimed. High precision machining wa eliminated, tolerances did not need to be so tight, assembly wa cheap and easy, and maintenance was simple.

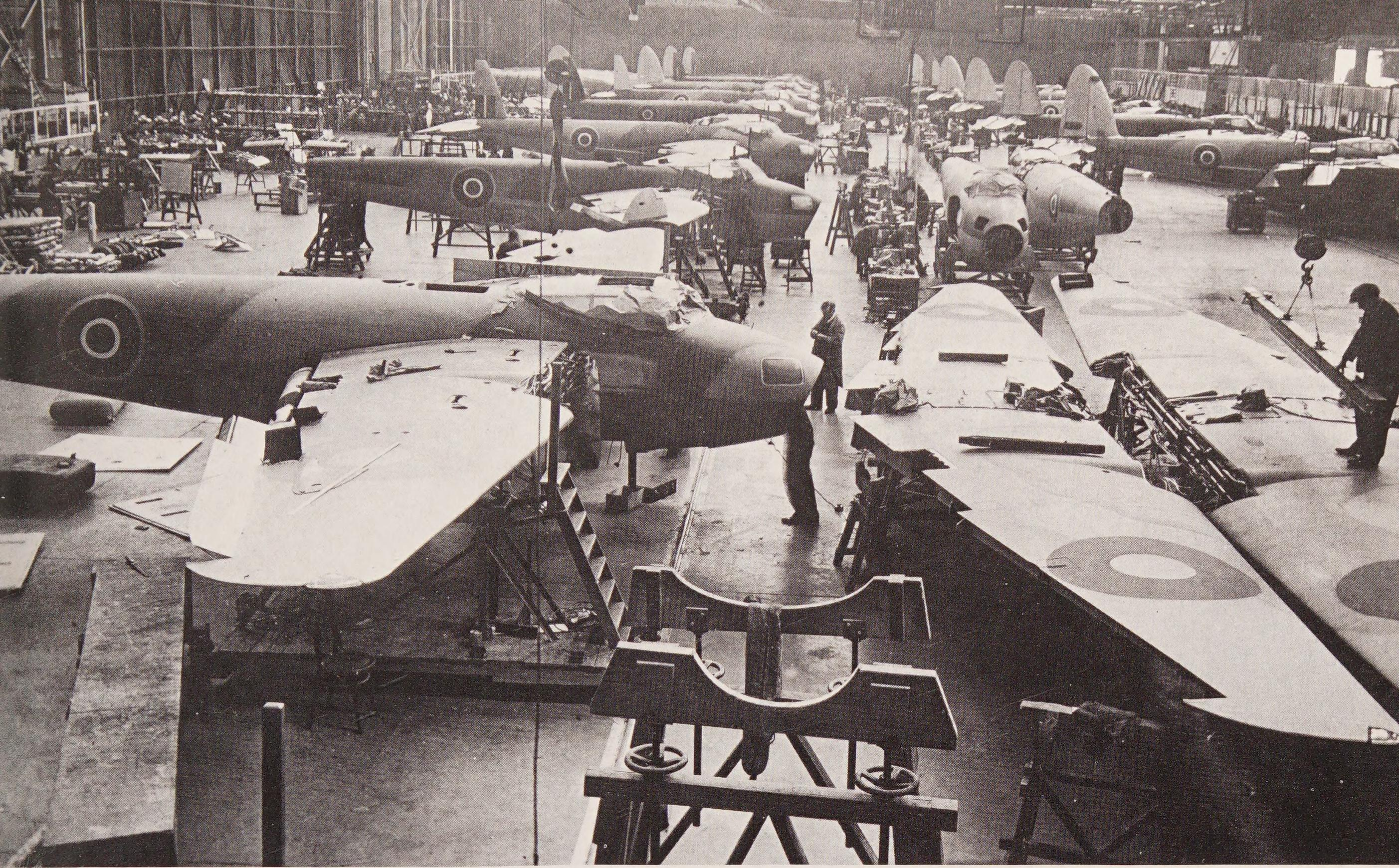
The shock absorption leg comprised a piston tube connecte directly to the axle at the bottom. At the top was an elliptical pisto of laminated, fabric-reinforced Bakelite. The outer casing was a tw piece, semi-elliptical pressing joined down the centre line, mad from 16swg DTD 124 steel. A guide block of bakelite material wa screwed into the lower end. There were a total of twelve rubbe blocks in the leg, moulded with lobes on the upper side an corresponding hollows on the underside. Between the blocks wer duralumin spacers, lubricated with graphite powder, which als lined the inside of the casing. Below the rubber blocks was a bakelit piston with a rebound rubber between this and the guide block.

The final assembly of the Mosquito was carried out on a "U" form track, moving down one side of the shop, across the end, an back down the other side to end by the paint shop. Two of these line were installed at Hatfield, one for the bombers and the other fo fighters. To make access easier, the aircraft were assembled as low a possible, on cradles which travelled sideways along the rails of th track.

Assembly commenced with the mainplane mounted on cradle and supported just outboard of the engine nacelles, the cradle having steps fitted for easy access to the top surfaces. Once the wing wa correctly positioned, the fuselage was lowered by crane from above picking up on the five location points. The fuselage side panels wer then assembled below the wings, followed by the tail components tailwheel and mudguard. The third stage was the assembly of th undercarriage, followed by the engine mounts and wing leadin edge radiators. The inboard fuel and oil tanks followed, and th remainder of the radio equipment was installed in the fuselage. I the case of the bomber and fighter bomber, bomb racks were fitted followed by bomb-doors, while the fighter and fighter bomber ha machine guns and cannon installed.

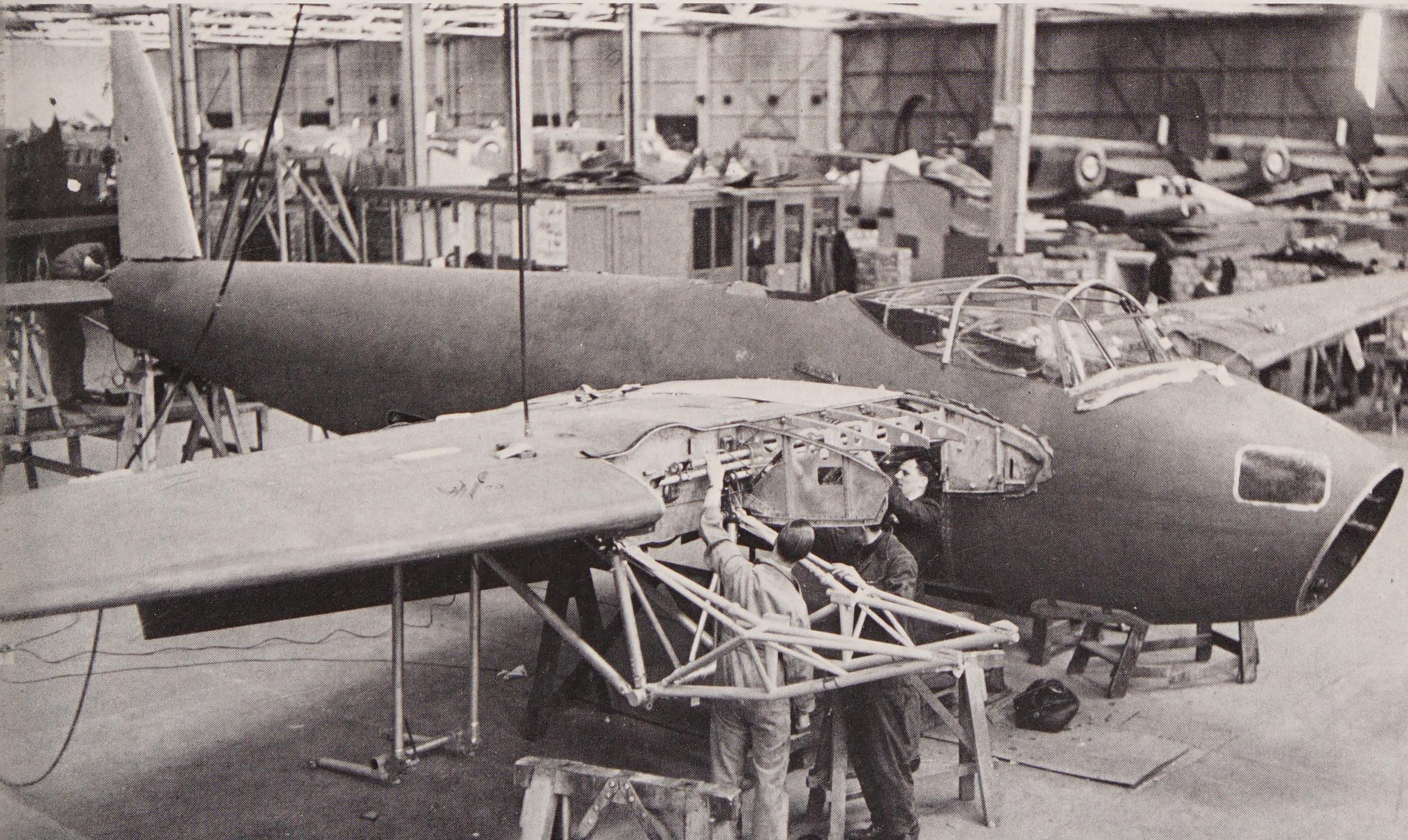
The engines were offered up as complete power units, with a accessories in position and the connections made to the cockp controls. All the engine nacelle fairings and cowlings were the fitted, followed by the undercarriage doors. While this was going o the various control surfaces were fitted and the cables linked up wit the cockpit controls. It was about this stage that the aircraft turne the U of the track and went on to final connection and testing of t various systems. Following the fitting of the wheels and axles, th undercarriage was operated, lowering into pits in the floor to kee the aircraft at their low level for accessibility. The de Havillan Hydromatic propellers were then brought in by overhead crane an assembled on the propeller shafts.

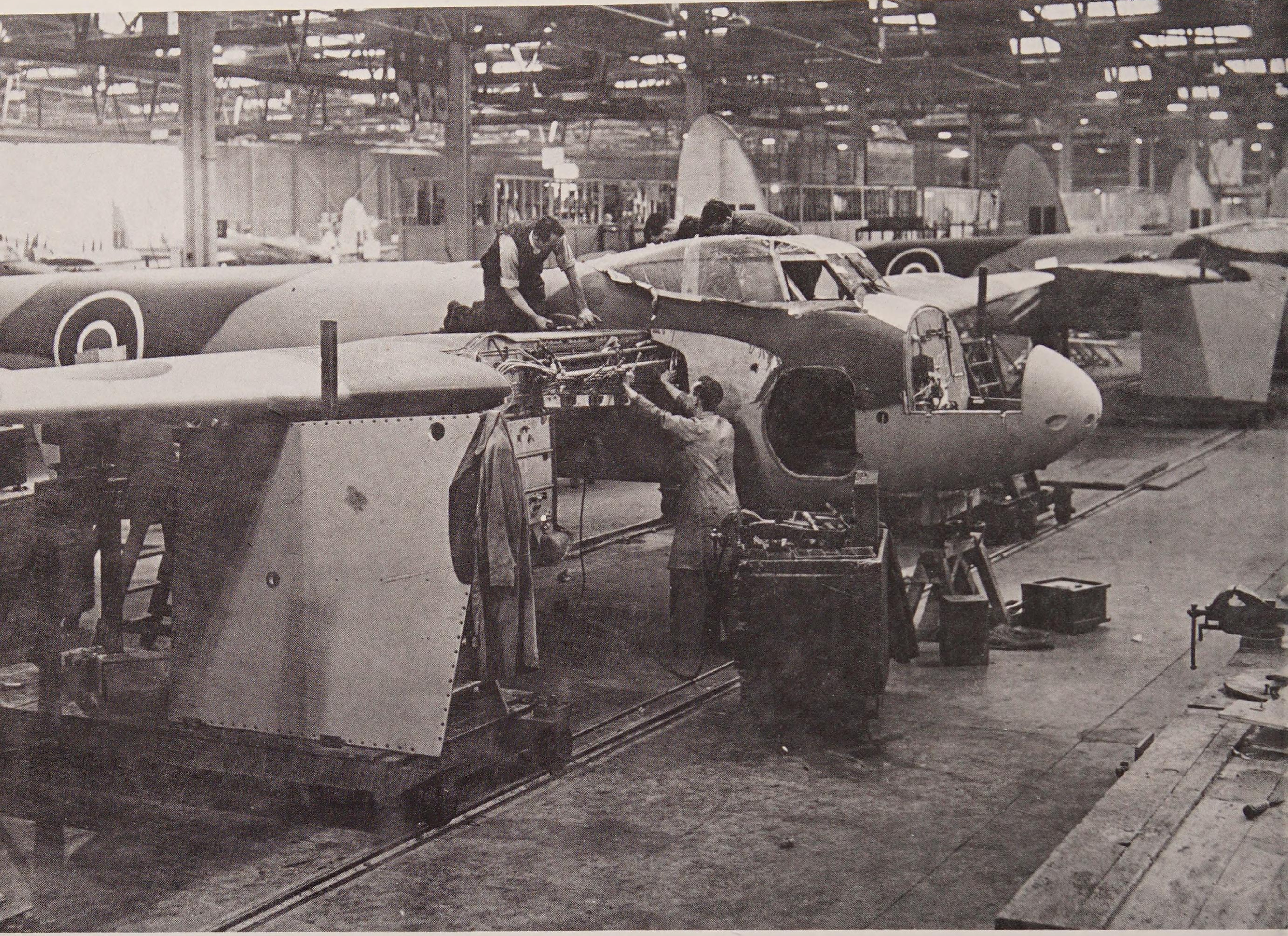
Functional testing of the bomb gear followed, and the Aeronautical Inspection Directorate (AID) inspection. The aircra was jacked up for coolant system test and final inspection befor



Mosquito assembly at Hatfield was on a U-Shaped track, with the aircraft moving sideways.

The first stage on final assembly was to join the wing and fuselage, to be followed by the tail surfaces, engine bearers and undercarriage mountings.





**The Hatfield fighter bomber line with tank bay doors removed for the installation of the fuel tanks.**

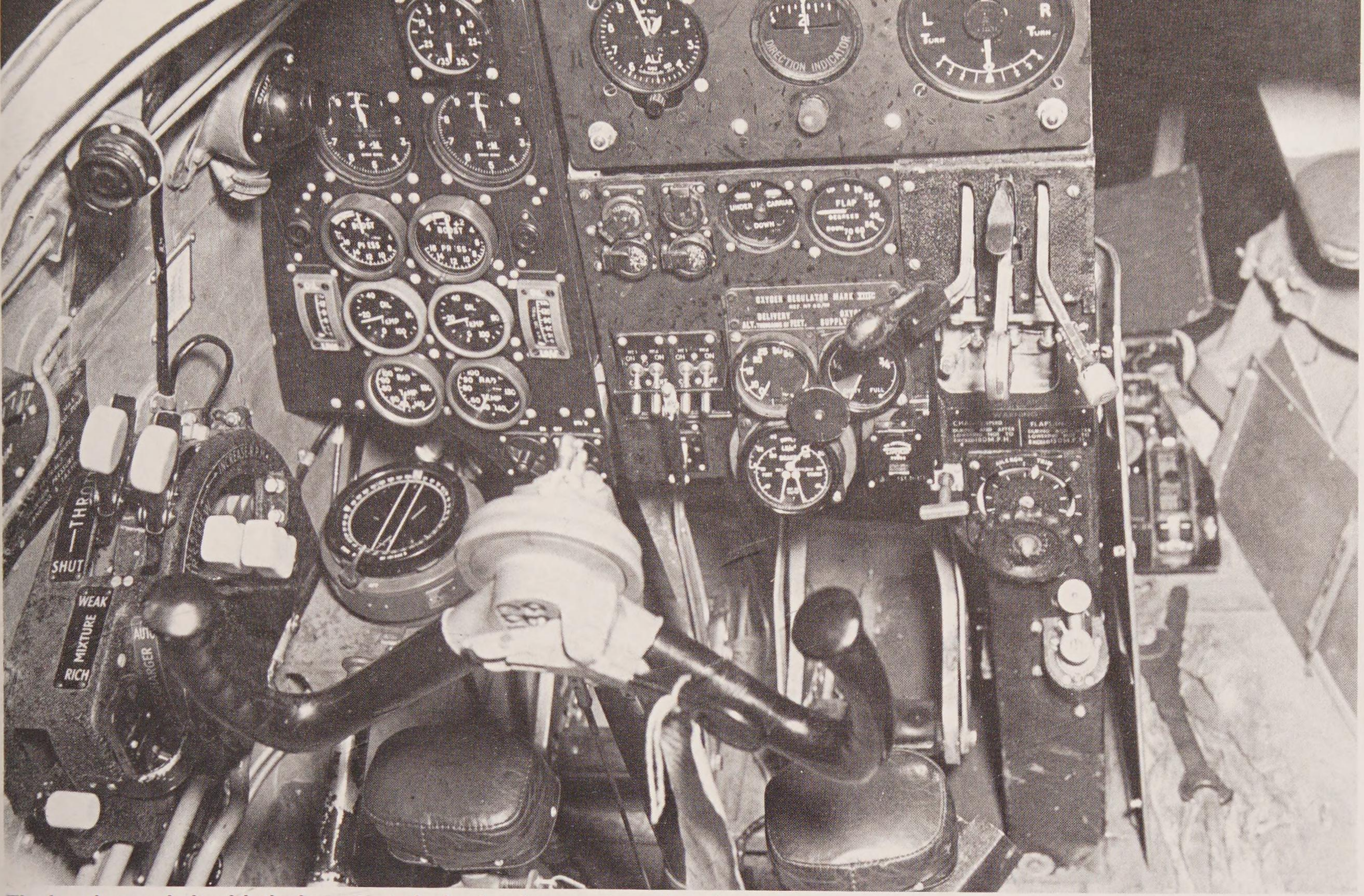
being wheeled away to the paint shop for completion of spraying and marking. It was then ready for flight test.

The most noticeable difference in the cockpit between the two basic types of aircraft was that the fighter had a control stick and the bomber a control wheel. The wheel gave more leverage and therefore improved manoeuvrability. Each aircraft was taken up on an initial production test flight lasting about an hour, when the general handling and systems operation was checked. Occasionally the aircraft was classed as a "Lulu", and would be off-test, but the average number of flights required to clear the production schedule and subsequent snags was three. Of course there was sometimes a "rogue", where all the tolerances were compounded and the aircraft was found practically impossible to clear, presenting nothing but trouble all its life. Pat Fillingham recalls that they used to have about 30 aircraft a week to clear and in the winter months, when fog was not uncommon, sometimes more than 100 aircraft could be on the airfield, but as it was generally well drained the surface did not cause any problems for the large low pressure tyres of the Mosquito. Fortunately the grass field allowed aircraft to land and take off int wind to avoid swinging.

As if the flying team at Hatfield were not busy enough, they als helped out on production flying at Leavesden, Luton and Coventry and had repairs at both home and Service airfields to cover as well

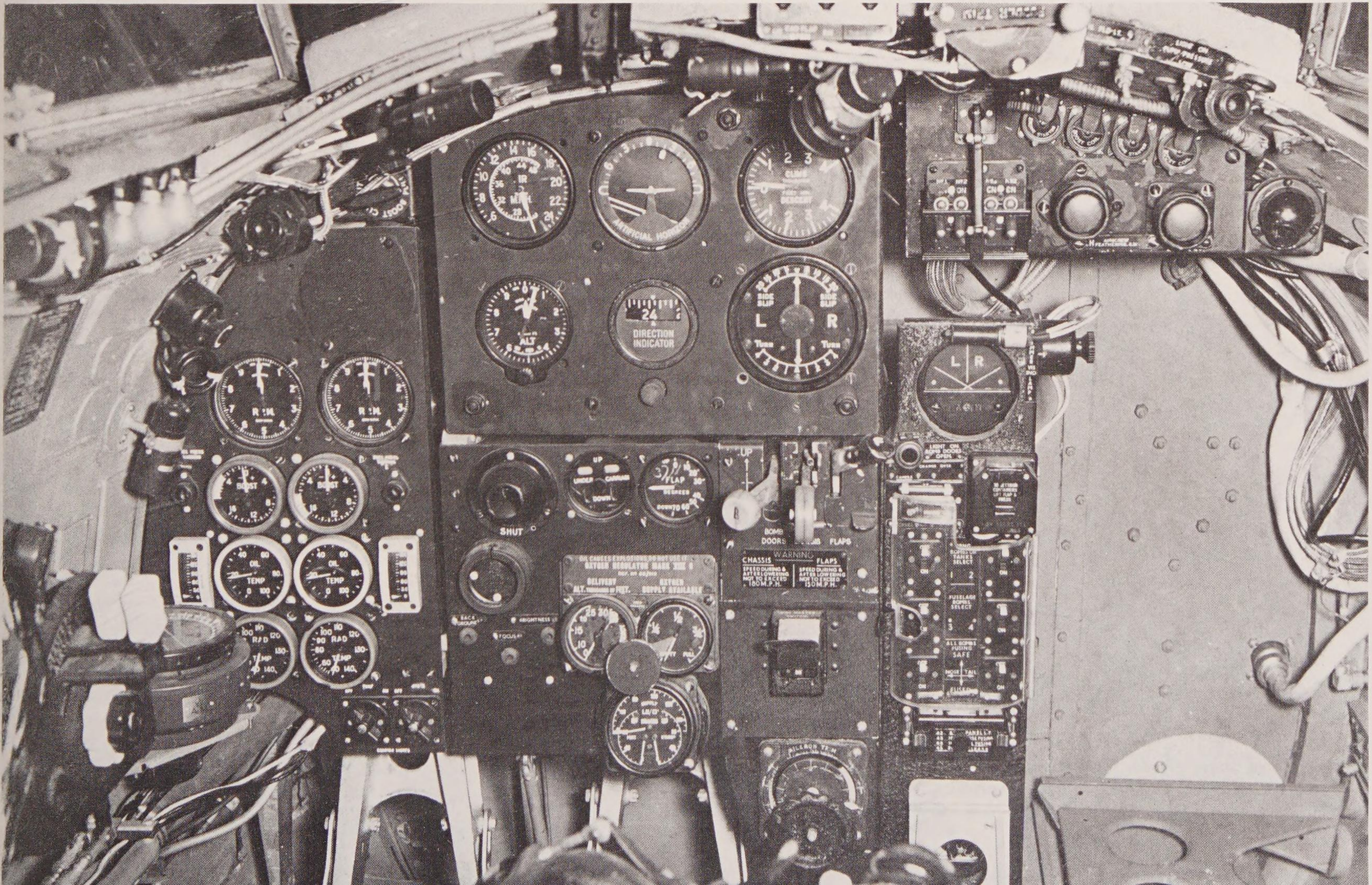
Pat Fillingham, one of the busy production test pilots, had traine with the de Havilland Aeronautical Technical School and learned t fly in the RAF Volunteer Reserve. He joined the Mosquit programme from Tiger Moths and Oxfords, starting on about th tenth aircraft. John de Havilland also joined at about the same time his brother Geoffrey and George Gibbins having shared the earlie aircraft. There was no dual instruction at that time, the new pilot simply being briefed on the aircraft and sent off for their first flight t prepare for the test flying duties. Pat eventually flew about 2,00 Mosquitoes. The numbers gradually grew as the production rat increased, the main handling problem being the setting up of th ailerons to avoid undue heaviness at high speed. The swing on tak off and landing was also a major hazard.

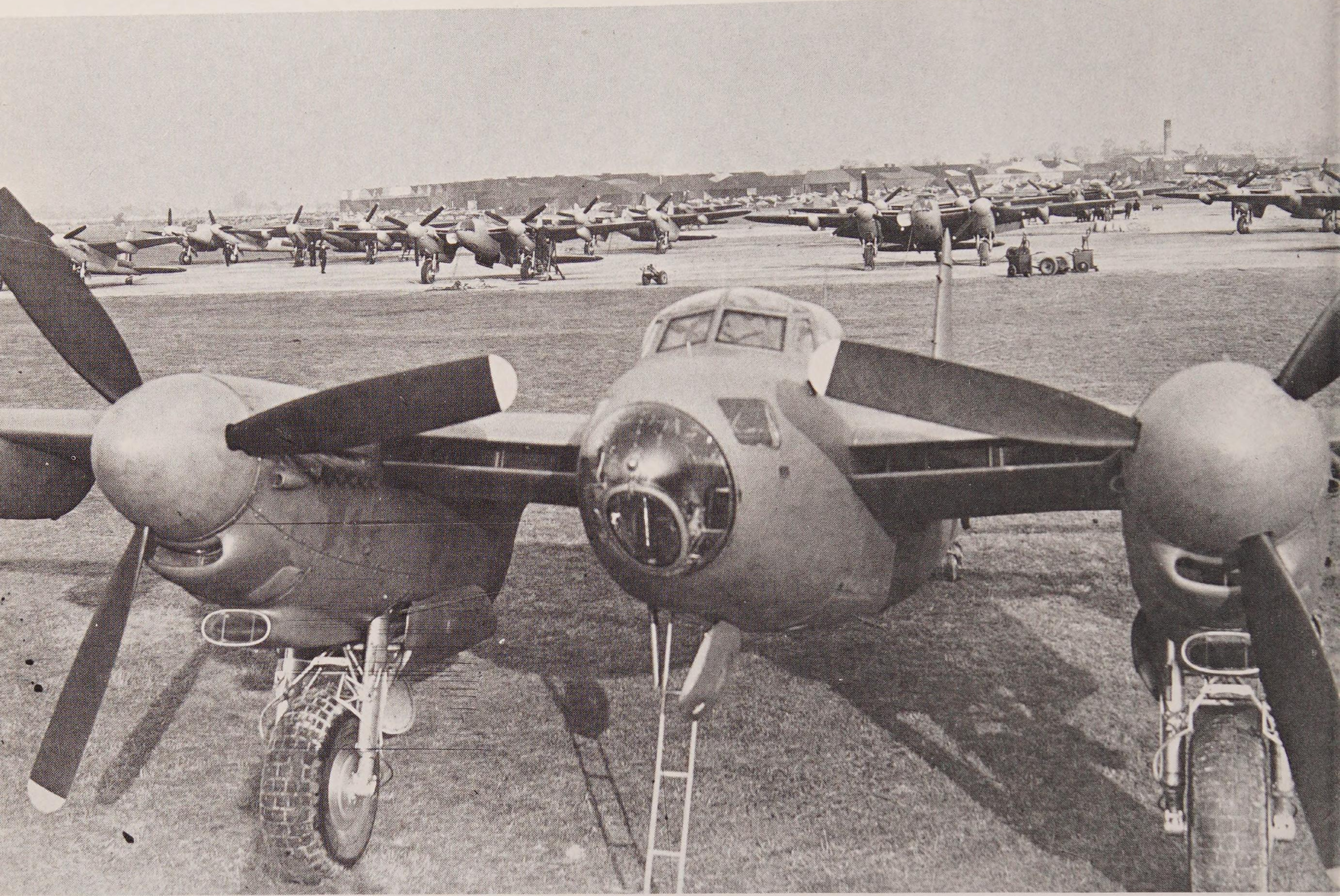
There was no radio at Hatfield, all control being by signal lam from the control tower. When there was cloud cover the pilot, wh was often flying alone, had to estimate when he was over the airfiel



The bomber cockpit with the horn control wheel and access through to the nose.

The fighter bomber cockpit with pilot's control stick and armour plated bulkhead on the right.





**A typical scene at Hatfield during the winter months with bombers and fighter bombers held up in flight test due to bad weather.**

and let down through it. Pat remembers seeing a chalk lion on the ground when he broke through cloud on one occasion. Realising that he was over Whipsnade Zoo, with all the high ground around, he rapidly climbed back up again. On other occasions the pilots became lost and landed at any convenient airfield to ask directions. Radio was, of course, fitted in the Mosquitoes for normal operations. The early aircraft had a generator on one engine only, and things could become a little difficult if it failed.

The incident Pat Fillingham remembers most clearly occurred on a test flight to altitude with an observer, when he had to switch on the oxygen. He began to feel drowsy as the aircraft climbed higher and the observer collapsed unconscious. Pat thought this rather curious, and decided to reduce altitude, when they both returned to normal. It was found that the oxygen bottle had been filled with compressed air, which was normally used for cleaning them out, and from then on the fittings on the compressed air bottles were changed so that the incident could not be repeated. Pat Fillingham was als asked to fly the high altitude Mosquito MkXV, which he particu larly appreciated as he was allowed additional rations t compensate for the extra height flown.

Once an aircraft was off test it was ready for collection by one c the Air Transport Auxiliary (ATA) ferry pilots (many of whom wer young ladies) who flew it to the Maintenance Unit. These ferr pilots always made sure they had plenty of height on the approach i case of engine failure, and many of them experienced the famou Mosquito swing take off. This could occur when the engines wer fully opened up, because power was not always available on bot engines, possibly owing to sticky oil in a propeller's constant spee unit. When the prop did develop its full power, it tended to com suddenly and cause a swing which could be quite violent. The onl way to overcome this was to exercise the airscrews thoroughly befor take off.

*Opposite.* **A vertical PR picture recording the damage following a raid.** *IWM*

# PART 2·OPERATIONS

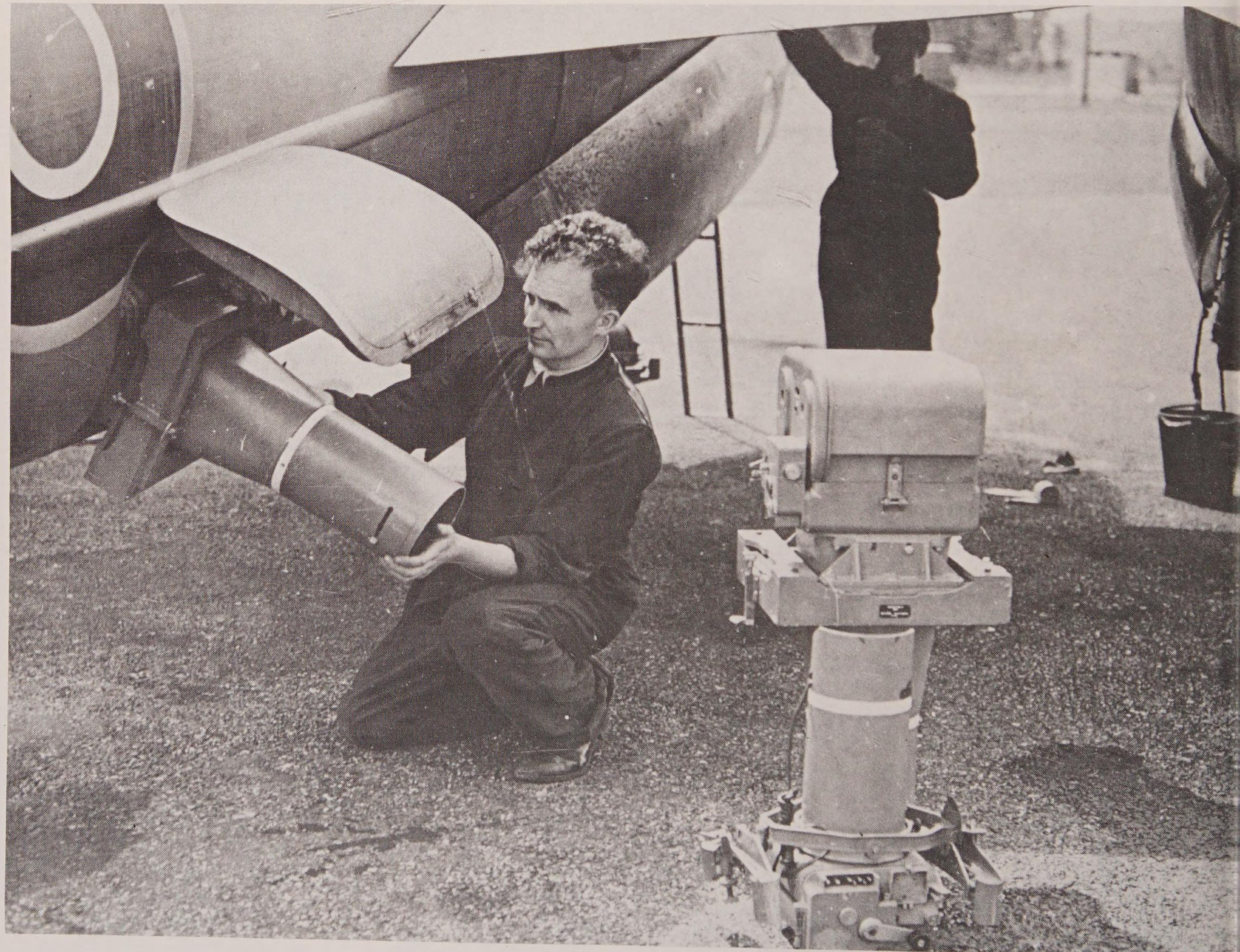
# PHOTOGRAPHIC RECONNAISSANCE OPERATIONS

Although the Mosquito was originally designed as an unarmed bomber, it first entered service with the bomb bay containing cameras, in the unarmed photo-reconnaissance role. At the start of World War Two neither side had made advanced preparations for the use of PR aircraft, but the RAF soon forged ahead using rapidly adapted unarmed Spitfires, later supplemented by the longer range Mosquitoes; consequently, the RAF always had good photographic coverage of the enemy in all theatres of war. In addition to its greater endurance, the Mosquito also offered the security of twin engines, navigation aids, additional camera installations and the assistance of a navigator to help pinpoint targets more accurately.

The photo reconnaissance specialists were No 1 Photo Reconnaissance Unit (1PRU) at Benson, Oxfordshire. On July 13, 1941, only eight months after the maiden flight of the prototype, 1 PRU took delivery of its first Mosquito, W4051, from Boscombe Down. Th prototype had also been adapted for PR development with camer ports in the forward end of the bomb bay and in the access door i the starboard side of the fuselage behind the wing trailing edge. O July 22, W4054 arrived at Benson, followed by W4055 on August 7 allowing the air and ground crews to train on the new aircraft an prepare them for operational service. Camera mountings had to b changed from metal to wood to damp out vibration, and oil tan swelling problems were overcome in time for W4055 to commenc operations on September 17, flown by Sqn Ldr Clarke. The target were Brest and the French/Spanish border, the photographic heigh being 7,315m (24,000ft). Results were entirely successful.

At first, ground crews felt it was a retrograde step to be working o wooden aeroplanes. However, they were gradually won round whe they found how well the substantial wooden structure stood up t damage, and how easy it was to repair. The young skilled fitters ha plenty of metal around to keep them busy, while the skille woodworkers could be kept gainfully employed.

**Cameras were installed in the bomb bay and fuselage of the Mosquito for unarmed photo reconnaisance before and after bomber attacks.** ***IWM***



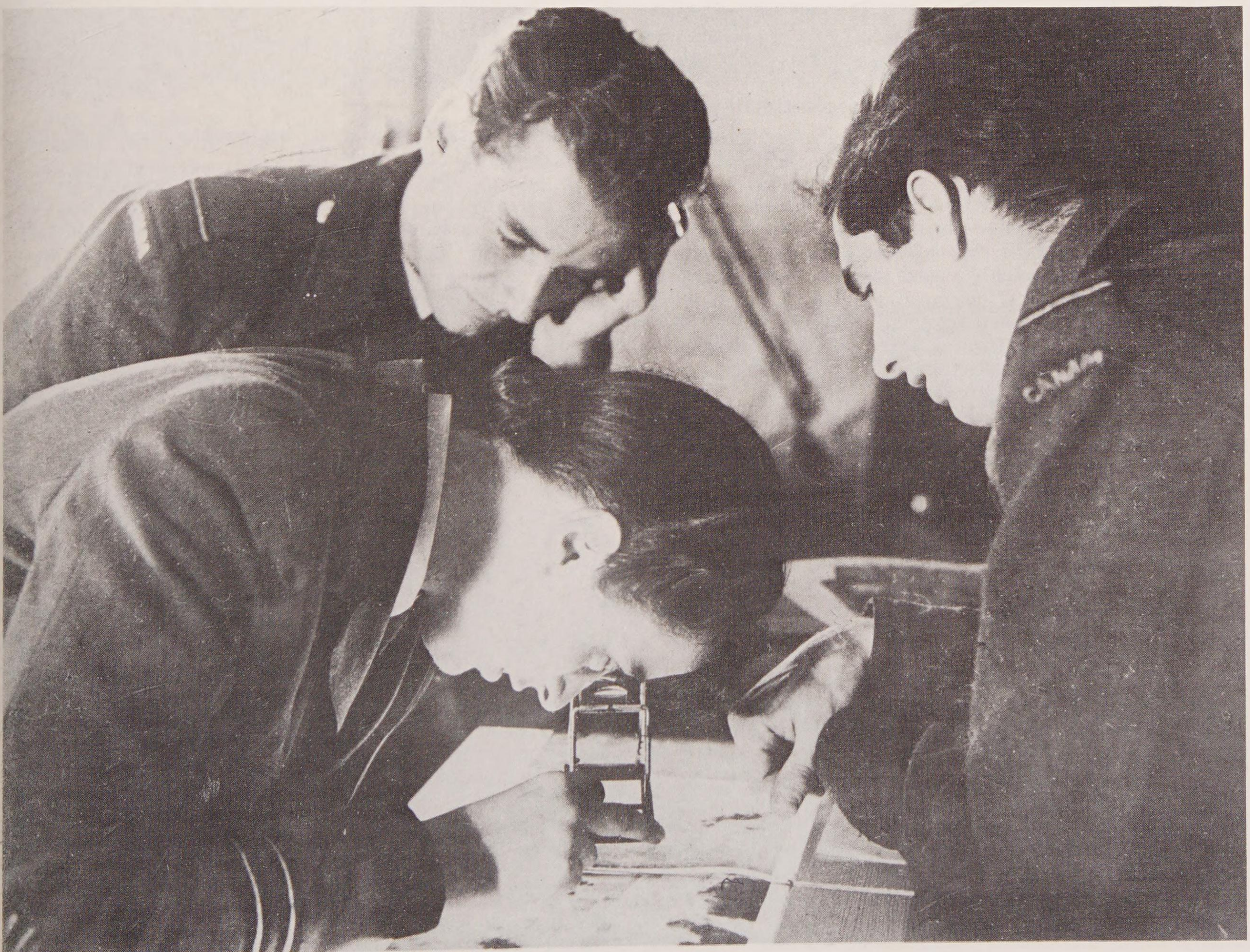
In October 1941 three PR Mosquitoes were sent on detachment to Wick, in Scotland, from where 16 sorties were flown over strategic areas of Norway. On the return flight to Benson the speed of the Mosquito was demonstrated by Sqn Ldr Clarke, who made the journey in a record 1hr 32min on October 15. In early December a return visit was made to Wick when four Mosquitoes were transferred from Benson. Once again, Norway was the target area on most missions. On December 4 came the first casualty, when Sqn Ldr Taylor and Sgt Horsfall flew W4055, known as Benedictine, on its 15th sortie, to the Trondheim – Bergen area, and failed to return.

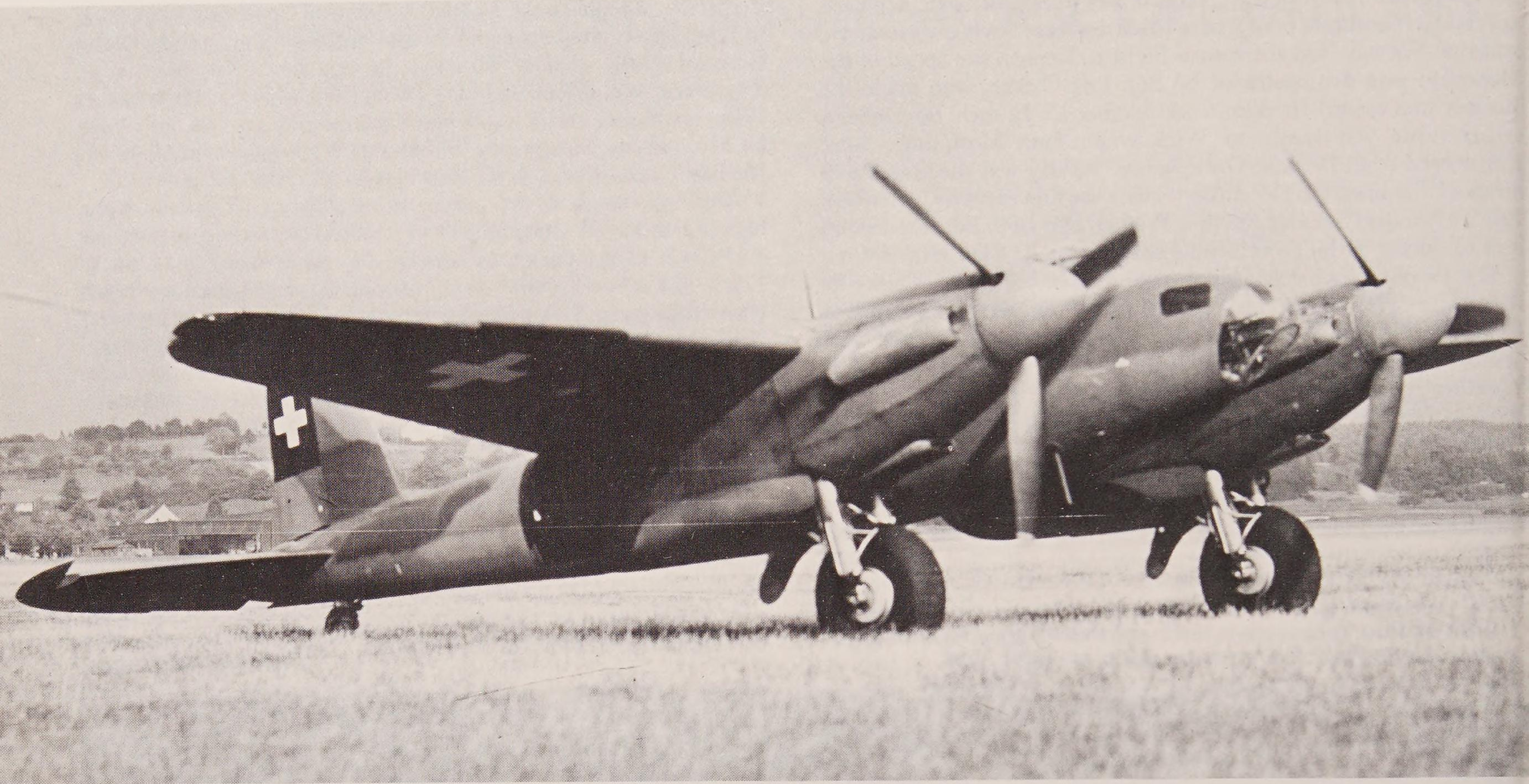
It was, of course, essential to have reasonably good visibility for successful PR operations, and during the winter months of December, January and February, bad weather interfered with operations. By this time the detachment had moved to Leuchars. Weather reporting was not so reliable at that time, and even when the weather was clear at base the target area was often obscured by cloud.

As the longer range PR.Is became available, commencing with W4060 early in 1942, flights could reach further afield, including targets in Poland. On February 22, flying W4051, Flt Lt Victor Ricketts and Russian Sgt Lukhmanoff flew to Cuxhaven and thence to Kiel, where they managed to take excellent photographs of the German battle cruiser *Gneisenau* in dry dock. Its sister ship, *Scharnhorst*, was discovered by a PR Spitfire whilst under repair at Wilhelmshaven, and a watch was subsequently kept on both ships by Mosquitoes. Mosquitoes W4051 and W4060 also photographed the French coast prior to the Commando visit to St Nazaire.

Although much of the photo reconnaissance was done at the higher altitudes of around 6,705m (22,000ft) depending on contrails and cloud cover, the crews occasionally came down to as low as 122m (400ft) when low cloud prevailed, rather than go home without pictures. Good photographic coverage of a target area was required before a raid, and to assess the success of the operation photographic aircraft had to be over the target as soon as the smoke and dust had settled. The first time the results of a Bomber Command blitz were recorded was on March 4, following the attack on the Renault factory in Paris. The weather conditions were grim, with no sight of the ground from immediately after take off until the crews found the River Seine at 274m (900ft) in heavy rain. The cloud got lower and lower, and the target was eventually photographed from 122m (400ft), the time spent over Paris being about 35min. Although the Mosquito was equipped with radio, this was of little help on the return flight, and an airfield was found through a rare gap in the low cloud.

**The PR photographs were taken in pairs and inspected through stereo viewers to achieve greater clarity of detail.** ***IWM***





**Mosquito interned in Switzerland as D920, possibly DK310 which force landed in August 1942.**

As mentioned earlier PRU had an urgent need for more Mosquitoes which could not be satisfied by the production lines, so four F.IIs and two B.IVs were collected from Hatfield and the cameras installed at Benson. Although the range of the PR.IIs was limited owing to the lack of long range tanks, the PR.IVs were able to make much deeper penetrations into enemy territory. In June 1942, the new 36in F.52 camera was becoming available. This normally operated at 1/300 second, f5.6, giving 1/8000 scale at 7,315m (24,000ft) with excellent clarity.

By flying to Murmansk and back a PRU Mosquito operating from Leuchars, was able to locate and photograph the *Tirpitz,* the 3,000 mile round trip being completed in a day.

In August 1942 Flt Lt Wooll was in the vicinity of Venice in DK310 when his starboard engine developed a glycol coolant leak, and soon after had to be shut down. Following this the temperature of the port engine began to rise, so he was forced to land at Belp, near Berne in Switzerland. His efforts to destroy the aircraft failed, and the Mosquito was interned with its crew, which was later exchanged for two German pilots. Flt Lt Wooll subsequently joined de Havilland Canada as a test pilot. The Mosquito remained in Switzerland for projected night mail flights which never took place, but logged 76hr between September 1943 and March 1953 on various test flights.

The PRU was working with such success using a variety of Spitfires and Mosquitoes, some on detachment, that it was decided to re-establish it as four squadrons in October 1942. 540 Squadron was therefore formed at Leuchars from H and L Flights of No 1PRU on October 19', equipped with the 12 PRU Mosquitoes. Although sorties were continued over Scandinavia, especially keeping an eye on *Tirpitz,* detachments served as far afield as Malta, in preparation for the North African landings.

To provide crews for the PRUs No 8 PR OTU was based at the exposed airfield at Fraserburgh, Aberdeenshire, the first Mosquito being delivered in December 1942.

In January 1943 two of the five Mosquito MkVIIIs were delivered to 540 Squadron. These were basically MkIVs fitted with two-stage supercharged Merlin 61s for higher altitude operation and two 227lit (50gal) drop tanks to serve as a stop-gap until the PR.IXs became available. The first MkVIII operational sortie was flown in DZ342 on February 19, but it was a failure due to the failure to open the rear camera lens mud flap. DZ364 had tried to photograph Berlin on January 19, but was intercepted and had to be satisfied with pictures of lesser targets, including Peenemunde, the value of which was not appreciated until by chance a V1 flying bomb was later spotted on the ground.

There was also a need for night photography, and during the winter of 1942/1943 Mosquitoes were used to develop the art, using American M.46 photoflashes of 600,000 candlepower. Following the success of these tests operational trials were conducted by 544 Squadron, using DZ538 from March 26. MkIVs were used until sufficient MkIXs were available to replace them.

A special Norwegian 333 Squadron was formed at Leuchars in May 1943 to specialise in the photo reconnaissance of their homelands, "B" Flight being equipped with long range Mosquito MkIIs and "A" Flight being equipped with Catalinas. The Mosquito crews were trained at 8 OTU, and the MkIIs fitted with cameras proved particularly useful, as their guns could be used against enemy aircraft. Operations commenced on May 27, and the first enemy aircraft to be destroyed by the squadron was a Dornier Do24 on June 13. The MkIIs were replaced by MkVIs from September 1943, and continued to serve on similar duties in Coastal Command until the end of the war.

The PR.IXs began reaching 540 Squadron when LR405 and '406 were delivered on May 29, 1943. A distinguishing feature was an observation blister in the canopy roof, and although this variant was not pressurised, two-stage Merlin 72s were fitted. Operations with the new version were commenced on June 20, when two aircraft were despatched, although one had to abort with a smouldering radio transmitter. 544 Squadron commenced MkIX operations with a Benson pool aircraft on September 13, flown by Flt Lt Dickie Blythe, but they received their first MkIX, LR478 on October 22. The new aircraft made greater endurance possible, the extreme example being a round trip to Frier, Regensburg, Linz, Vienna, Budapest, back to Vienna, Sarbono, Bucharest, Foggia and landing at Catania. While taxiing in from this "Cook's tour" the engines stopped due to complete exhaustion of the 3,455lit (760gal) fuel load. In six and a half hours 3,057km (1,900 miles) had been covered at an average speed of 470km/hr (292mph), giving a fuel consumption of 0.884km per lit (2.5 miles per gallon). 541 Squadron commenced Mosquito operations from Gibraltar when it absorbed the "B" Flight from 544 Squadron in October, and a new "B" Flight was formed in Britain when 544's Spitfire operations were phased out.

A major photographic target during 1942 and 1943 was Peenemunde on the Baltic Coast, where the V-weapon development was undertaken. As a result of the photographs obtained, a major Bomber Command raid was despatched on August 17-18, and two days later a PR Mosquito photographed the damage. On October 3 Flt Off Constance Babington-Smith, working on the interpretation of the photographs, discovered a small aircraft on the airfield at Pennemunde, and when earlier photos were rechecked, more of these pilotless V–1 flying bombs were identified. Before the end of the month their launching ramps were discovered in Northern France, and 140 Squadron began using Mosquitoes in the tactical photographic role, usually at very low altitudes, to help identify the growing number of these "ski sites".

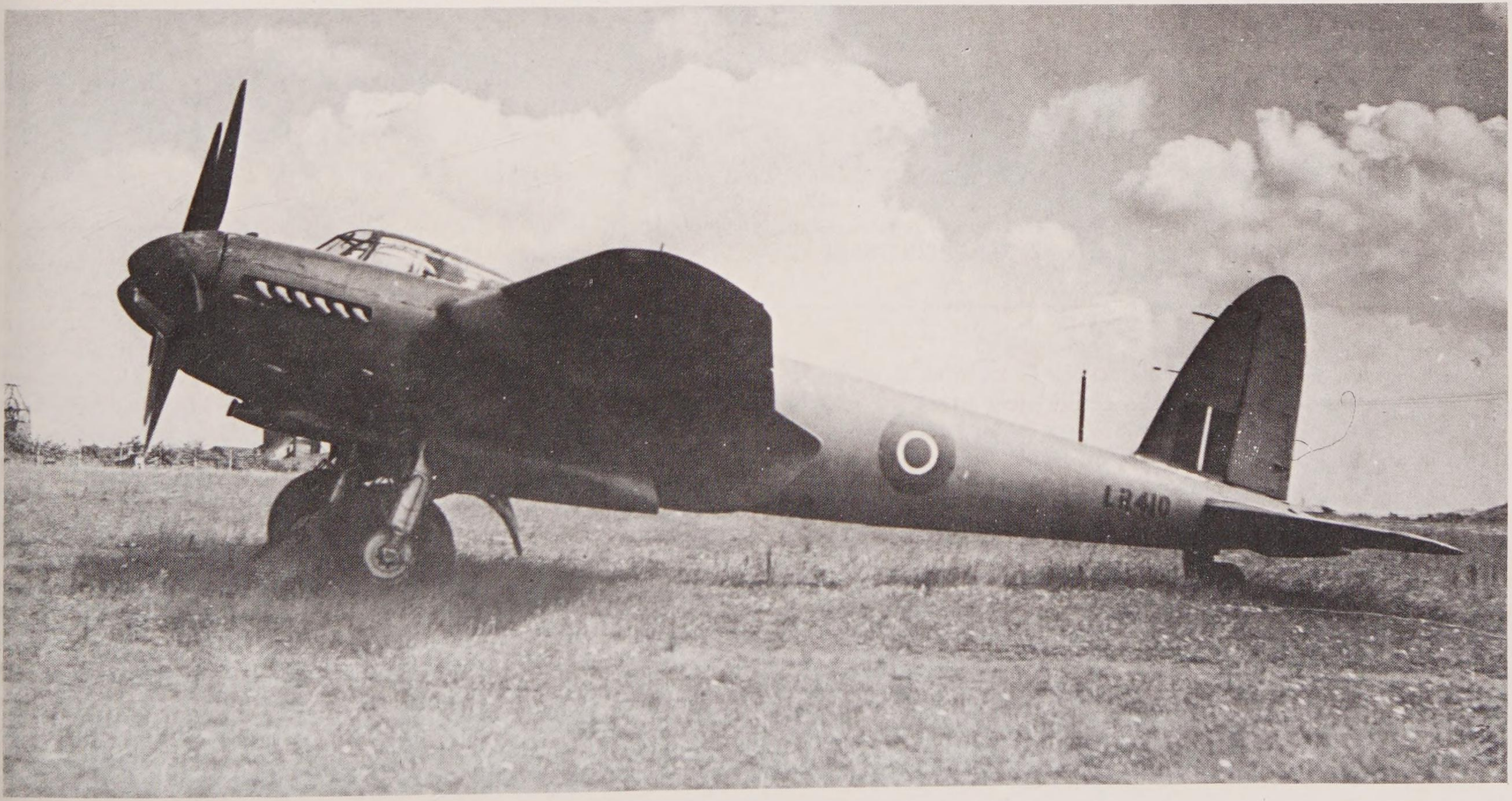
With the build-up of PR.IX operations ranging widely throughout Europe the earlier aircraft were withdrawn, the final PR.IV sortie being flown by DZ473 on September 10, followed soon after by the MkVIII. The Mosquito was not only operating with great success, but was largely immune to enemy attack. During the winter months the Mosquitoes were increasingly betrayed by their condensation trails but so were the defending fighters. However, flak was always a hazard. To gain extra altitude, eight MkIXs were fitted with Merlin 76/77 engines driving paddle-blade airscrews, which improved both ceiling and speed. A problem, however, was the icing-up of canopies, and the MkXVI with its pressure cabin was no better, because cockpit heating was not available when it entered service with Nos 140 and 400 squadrons in December 1943.

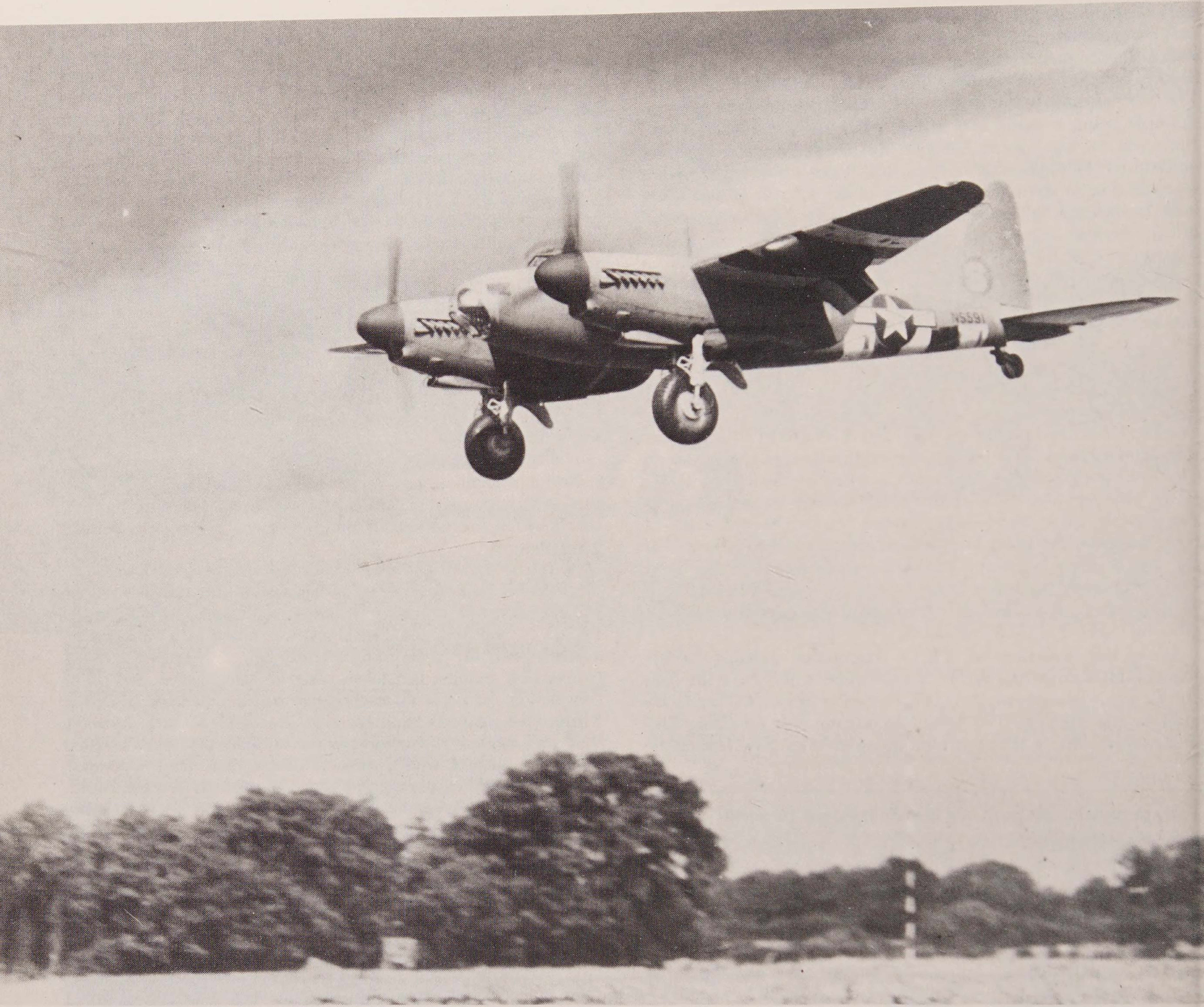
Mosquito PR.XVIs were delivered to the US 8th Army Air Force at some of its British bases from February 1944, initially for weather reconnaissance. Six aircraft were later fitted with special radomes to test H2X (the American equivalent of British H2S), and based with 482nd Bomb Group at Alconbury. Both the MkIXs and XVIs suffered from niggling problems during the early part of 1944, including misting and icing of the cockpit canopies and lack of observation blisters in the MkXVI. The latter version also seemed to be inferior to the former. It was not until February 4 that 140 Squadron made the first operational sortie with a MkXVI. Use was now being made of forward-facing cameras, especially at low level, where better target guidance was obtained and a lack of subject movement helped clarity.

Berlin was an urgent target for reconnaissance photographs during the latter part of 1943, but it was not until February 19, 1944, that a 540 Squadron aircraft found weather clear enough to obtain good pictures.

Numbers 4, 140 and 400 squadrons were assigned to the 2nd Tactical Air Force to cover reconnaissance duties, the early months of 1944 being a busy time. 4 Squadron, with a mixture of Mosquito PR.XVIs, Spitfires and Mustangs, was based at a very muddy Sawbridgeworth, their target area being Northern France. Conversion training had taken place at Aston Down, and on its completion the move to Sawbridgeworth was made on March 3. Mosquito operations commenced on March 20. By early April the unit had moved to Gatwick, which at that time was a rather restricted airfield with approach obstructions, and Operation "Crossbow" flights, photographing V1 launch sites were continued. One of the navigators with 4 Squadron was Flt Lt Freddy

**Early production PR.MkIX LR410 at Rolls-Royce, Hucknall.**



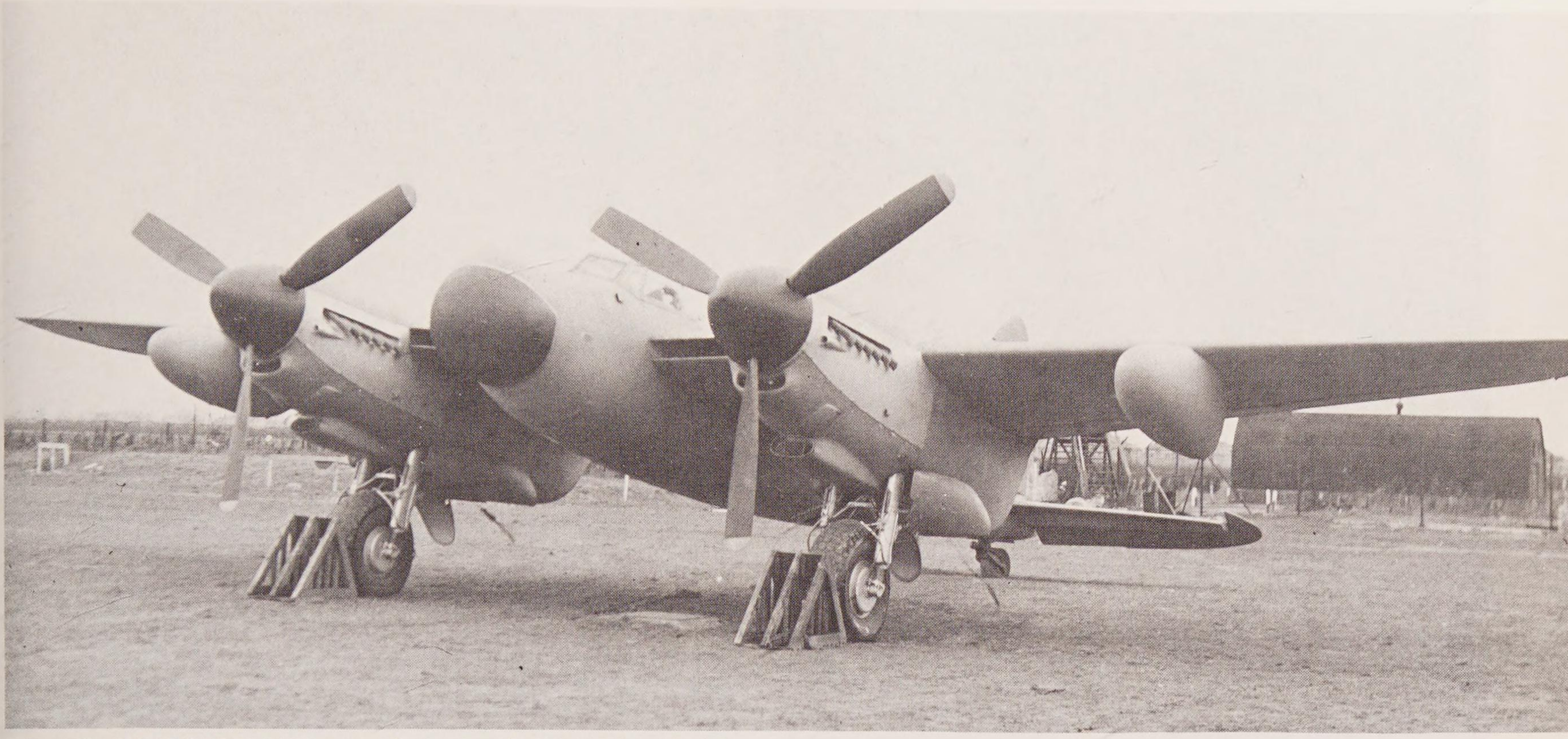


**Mosquito PR.XVI NS591, S of the 25th Bomb Group, 8th USAAF landing at Watton on February 22, 1945.** *Flight*

Andrews, who, after training with Coastal Command, faced duties in Coastal Command Beaufighters or PR Mosquitoes. He feels he was fortunate in being allocated to the latter, and joined the Squadron during its training at Aston Down. The pilots with the squadron had mainly converted to Mosquitoes from single-engine types such as the Spitfire, and were more accustomed to doing the flying and navigation themselves, in some cases finding difficulty adapting to the team effort. Freddy Andrews recalls that a Mosquito FB.VI at Gatwick was to be returned to an MU for salvage of useful parts and the scrapping of the remainder. However, soon after take off from Gatwick, during the customary circuit overhead before setting course, power was lost on one of the engines and the decision taken to land again at Gatwick. Unfortunately the aircraft undershot, damaging its undercarriage and losing at least one wheel on the subsequent bounce. The Mosquito careered sideways across the airfield, coming to a halt inside a hut which collapsed on top of it. Neither crew member was hurt, and fortunately the occupants of the hut were outside at the other end, queuing for their cup of tea and a wad from the NAAFI waggon. However, the crew had saved the MU the job of scrapping the Mosquito, as major damage included the breaking off of the fuselage behind the wing. In May, the surprise news came that the Squadron was to cease Mosquito operations, as the Spitfire was more suitable for work from advanced front line airfields, and the last Mosquito sortie was flown on May 20.

Similarly, 400 Squadron operated Mosquitoes for only a short period. Its first MkXVIs arrived on December 22, 1943, but it was not until March 26 that the first operational flight took place. On May 12, the six Mosquitoes were withdrawn after 43 sorties and taken off squadron charge on May 29.

140 Squadron concentrated on Mosquito tactical operations, its Spitfires being replaced by April 10. The Squadron's efforts were concentrated on obtaining material in preparation for the D-Day landings. To do this, night photography was developed, the first operation with photoflash taking place on May 4.



**Mosquito PR.XVI MM308/G, one of six aircraft fitted with special radomes, covering the H2X scanner and used by the 482nd. Bomb Group at Alconbury.**

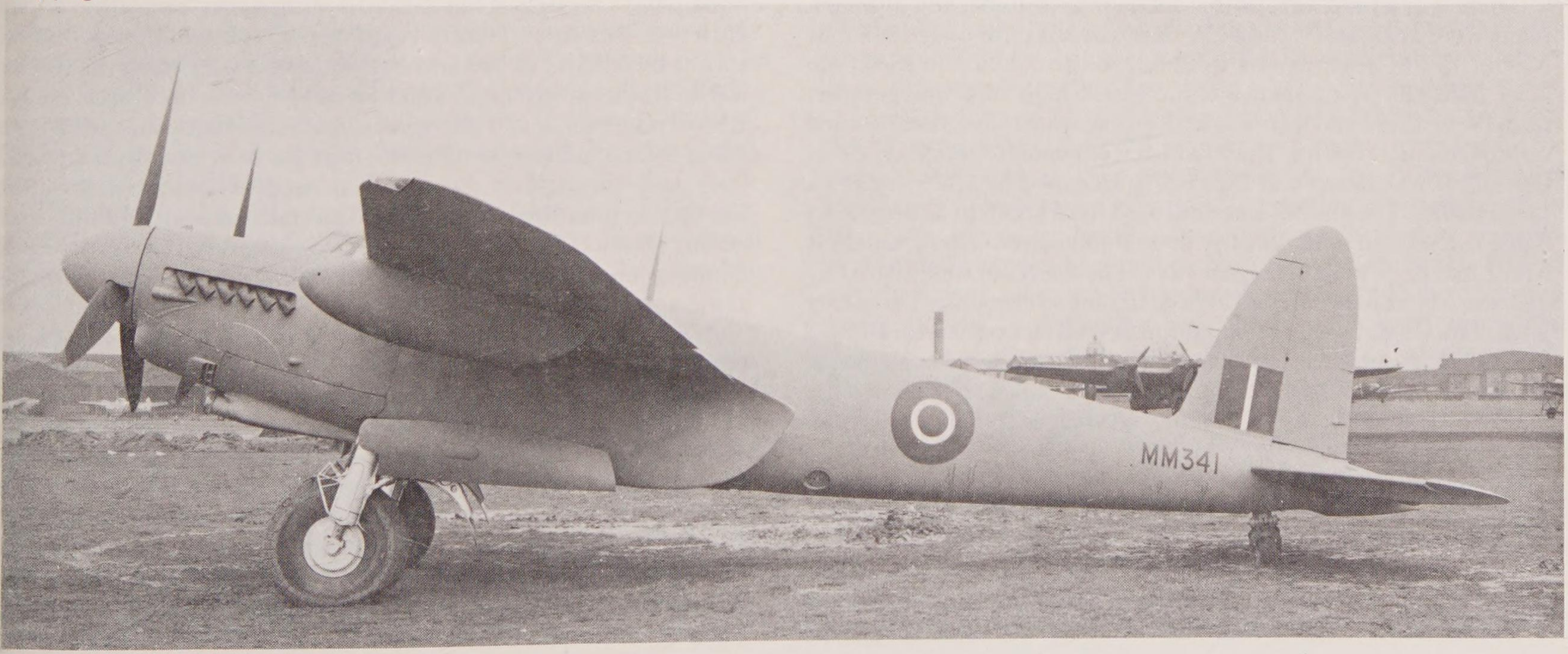
From March 1, with D-Day approaching, 540 Squadron concentrated its strategic operations at Benson, flying over France and southern Europe, its Mosquitoes occasionally meeting up with enemy aircraft. The PR.XVI was introduced into the Squadron on May 31, but bad weather hampered effective PR operations, in the period immediately prior to D-Day.

Sharing the D-Day activities with 140 and 540 squadrons was 544, which concentrated on strategic coverage of the rail communications in central and southern France, using forward-facing cameras and operating at low altitude. One of the 544 Squadron aircraft returned home with rudder cables cut after being damaged by flak, failed electrics, no engine instruments, radiators jammed shut and three other hits. With the arrival of MkXVIs, the Squadron was able to fly as far afield as Western Germany, later penetrating right across the country.

In mid-1944, aircraft equipment improved with the installation of K.19 cameras in 140 Squadron, and navigational accuracy was improved with the installation of "Rebecca H" and "Gee". The two strategic squadrons shared the tactical responsibilities of photographing troop concentrations and movements. The team effort with the navigator enabled more accurate coverage to be obtained, especially at the lower levels under cloud.

The US 8th Army Air Force used Mosquito PR.XVIs for meteorological reconnaissance, where the high speed was an effective defence. The aircraft carried a dozen M.46 photoflashes, each of 700,000 candlepower, and were based at Watton with the 25th

**Mosquito PR.XVI MM341 taken at Hatfield in February 1944.** *Crown Copyright*



**Percival built PR.34A DH-T, of No. 540 Squadron normally based at Benson, taking off from Farnborough in September 1950. Cameras were also fitted in the leading edge of the wing drop tanks.** *Flight*

Bombardment Group from August 1944. Others were later based with the 492nd Group on "Carpetbagger" operations from Harrington, providing communications with Allied agents on the Continent.

In July 1944 Mosquitoes began to encounter the jet-powered Messerschmitt Me262, one of the first to do so being MM273 of 544 Squadron on July 25 in the Munich-Stuttgart area, when it escaped in cloud. Mosquito PR.XVIs were used to locate the *Tirpitz* in Tromso Fiord, which required a 3,379km (2,100 mile) flight carrying 454.5lit (100gal) drop tanks.

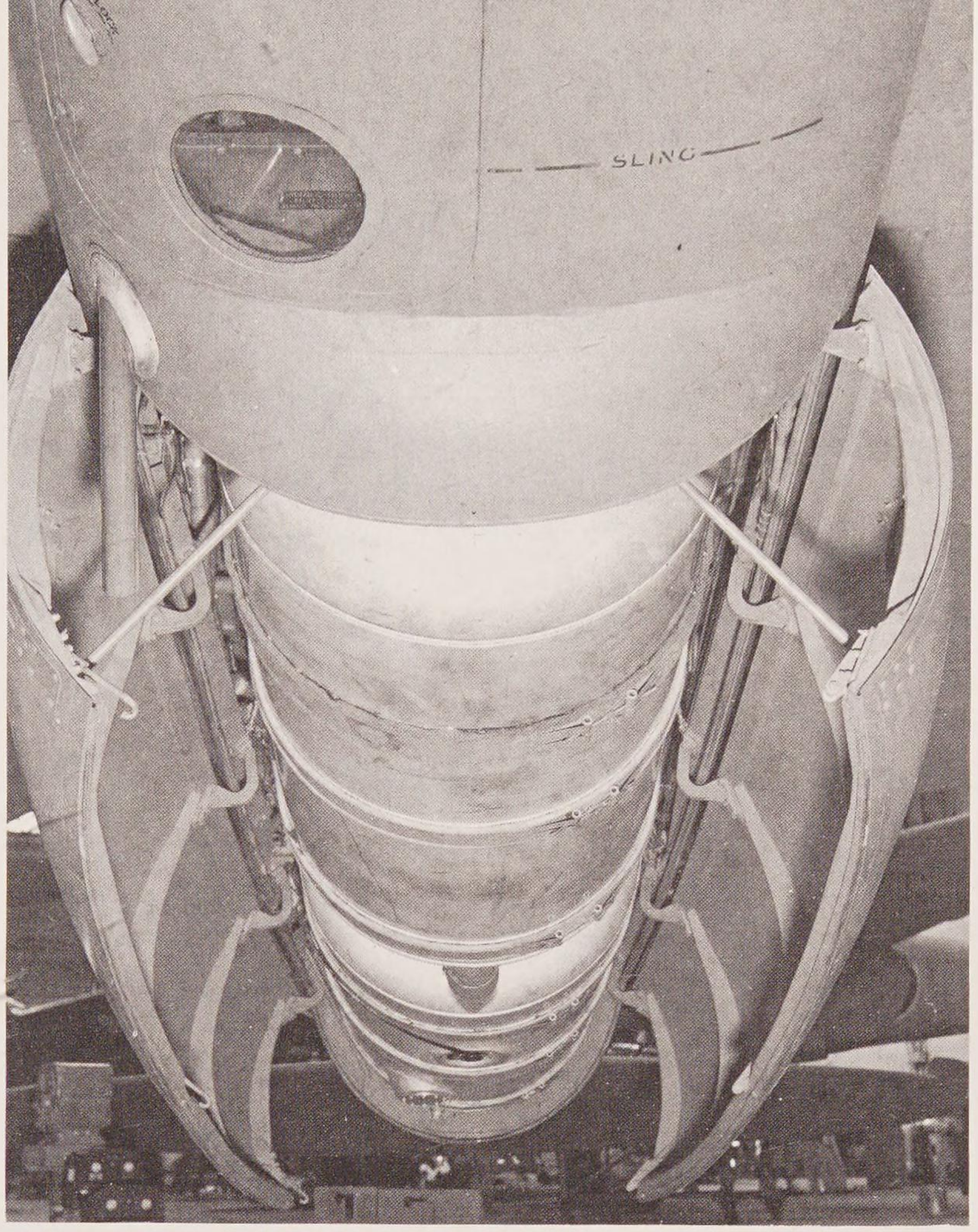
There was a need for a further increase in altitude, and although plans were afoot at the end of 1942, it was not until early 1944 that Merlin 15 SM engines were available for installation in Mosquito XVI MM328. Wing span was increased, high supercharger gear ratios were fitted and tare weight decreased, amongst other detailed improvements. During trials which commenced on May 20 at Benson, it was found that the ceiling increased by 1,219 – 1,524m (4 – 5,000ft). The aircraft was destroyed in an accident at Benson on April 1, 1945, but not before five more similar aircraft designated PR Mk32 had been built in August 1944. These aircraft were shared by 540 and 544 Squadrons, and arrived in time to encounter the enemy jet and rocket fighters. 544 Squadron flew service trials with a PR.32 NS587 in November, but snags were found with overheating engines, lack of cockpit heating and icing troubles. NS580 was the first to be flown on operations, serving 540 Squadron from December 5, 1944.

As well as these high level sorties, low level missions were still being flown, using forward-facing cameras in each drop tank. MkIX MM235 having been modified for this work, was lost on August 11, 1944, and was replaced by another MkIX, LR432. However, a similarly-modified MkV1, PZ345, which was able to shoot back at defenders of its targets, was more effective. As more of Europe became liberated 140 Squadron moved forward with the 2nd TAF, finding deeper penetrations into enemy territory easier. Flying by day and night, they rarely encountered defending fighters.

544 Squadron diversified its operations by flying urgent diplomatic mail flights between Northolt and Moscow on Operation "Frugal", commencing on October 9, 1944. These flights took about 6½ hr at an average speed of 300mph. Similar flights were also made to Cairo and Naples, the aircraft later going on to Operation "Haycock" and the Potsdam Conference.

In the early months of 1945, with the defeat of Germany inevitable, the PR Mosquito units were kept increasingly busy, flying around the clock to keep an eye on enemy communications. In April 1945 the first PR.34 with much increased fuel load joined 544 Squadron, carrying 909lit (200gal) drop tanks under the wings. However, this aircraft was not used on operations in Europe, as final sorties by MkIXs of 540 and 544 Squadron were flown in the first week of March. 540 Squadron moved to France on March 29, and RF970 made the unit's last operational sortie flight on April 26. 544 made their final operational sortie from Benson, having performed a vital task throughout the war and ranged far and wide across Europe in unarmed, high speed aircraft, almost immune from enemy attack. They gave the Allies knowledge vital to assure success of operations against the enemy, who curiously did not attempt the same operation themselves.

After the war Mosquitoes continued their photo reconnaissance operations, 58 Squadron at Benson being one of the units concerned. This Squadron had started with "A" Flight having Mosquito PR.34s and "B" Flight using Ansons, but the Ansons were replaced in 1951 by Mosquito PR.35s, a little-known conversion from the B.35 bomber. 58 Squadron was the only unit to operate this version, the conversion having been undertaken at Leavesden of about eight aircraft, of which four saw service with the Squadron. This conversion allowed greater room in the bomb bay for additonal photographic equipment, and also enabled photo flares to be dropped for night photography. Prior to this the photo



**The bomb bay of the Mosquito PR.34 was filled to capacity with extra fuel tanks. The bomb doors did not open in flight.**

flashes were usually carried beneath the wings. The PR.34 had its bomb bay filled with long range fuel tanks instead, the doors being fixed shut. Much of the work of the PR.35s was on the improvement of night photography, no doubt to the later benefit of the early Canberras. The aircraft later moved on to Wyton to continue their trials.

In the opinion of David Ogilvie, Manager of the Shuttleworth Trust veteran aeroplane collection at Old Warden, who flew with 58 Squadron, the PR.34 Mosquitoes were probably the least pleasant version of the aircraft, owing to its very high all-up weight with a full load of fuel. Unlike the other marks the aircraft appeared to have very little desire to fly, and had a greater elevator balance weight, no doubt to help get the tail off the ground on take off. Even loaded the same as the B.35, the similar PR.34 with its bomb bay tanks empty was not pleasant to fly, although it was otherwise practically identical. However, when endurance was needed, the seven hours or so of the PR.34 was ideal, although the cockpit was somewhat cramped. Training flights could be made from Benson to Gibraltar, to Castel Benito and back to Benson, spending five days away training on detachment.

Training at this time began by flying Mosquito T.IIIs and FB.VIs with 204 AFS at Brize Norton, going on to operational training at 237 Operational Conversion Unit (OCU), Leuchars, on PR.34s.

The PR.34s were so heavy on take off with full fuel, that if trouble was encountered it was necessary to fly around for about an hour to burn off fuel down to landing weight. Jettisoning drop tanks was not recommended in case only one released. 58 Squadron had a B.35 as a "hack" to keep the pilots up to scratch, and being totally empty of operational equipment it was a delight to fly.

One intelligence task which involved the Mosquito PR.34s of 58 Squadron was known as Operation "Dimple". It entailed flying over to West Germany to refuel and then flying at maximum altitude and range in an easterly direction, a job which is now done by satellites.

Europe was the main theatre of operations for PR Mosquitoes, but they were also operated to a lesser extent in the Mediterranean, Middle East and Asia, where knowledge of enemy movements and targets was equally vital. The Mediterranean operations complemented the UK-based PR operations over Northern Europe by covering the Southern flank, but because the UK based squadrons were given priority, there were delays in making Mosquitoes available further from home.

The initial Middle-Eastern Mosquito operations were carried out by aircraft flown out from Benson to Malta to check endurance, which turned on their cameras over Italy en route. The early change from casein glue to formaldehyde made the bonding of the structure more suited to the hotter climates, but the first two tropicalised long range Mosquito PR.1s to be based in Malta were written off, either by landing in soft ground or by enemy action.

Towards the end of 1942 60 Squadron South African Air Force (SAAF) was covering the PR requirement, but was limited by the short range and relative vulnerability of its Baltimores and Marylands. Their range was fine for covering the movements of Rommel's troops in North Africa, but any European coverage further afield needed Mosquitoes. Two Mosquitoes, MkIIs DD743 and '744, were allocated to hot weather trials and left to sit on a desert airfield to determine how they would stand up to the extremely hot climate. Fortunately, after General Montgomery's direct approach to Winston Churchill, these two aircraft were allocated a more active role and delivered to Castel Benito on February 4, 1943, where, despite the unfamiliarity of the air and ground crews, the aircraft gave surprisingly little trouble. A camera was fitted under the cockpit on each aircraft, and up to four sorties a day were achieved within a very short period. No 60 Squadron's first operation was flown in DD744 on February 12, 1943, and the two aircraft continued in service until DD743 was lost on July 5, 1943, and DD744 was damaged and withdrawn from use on August 6.

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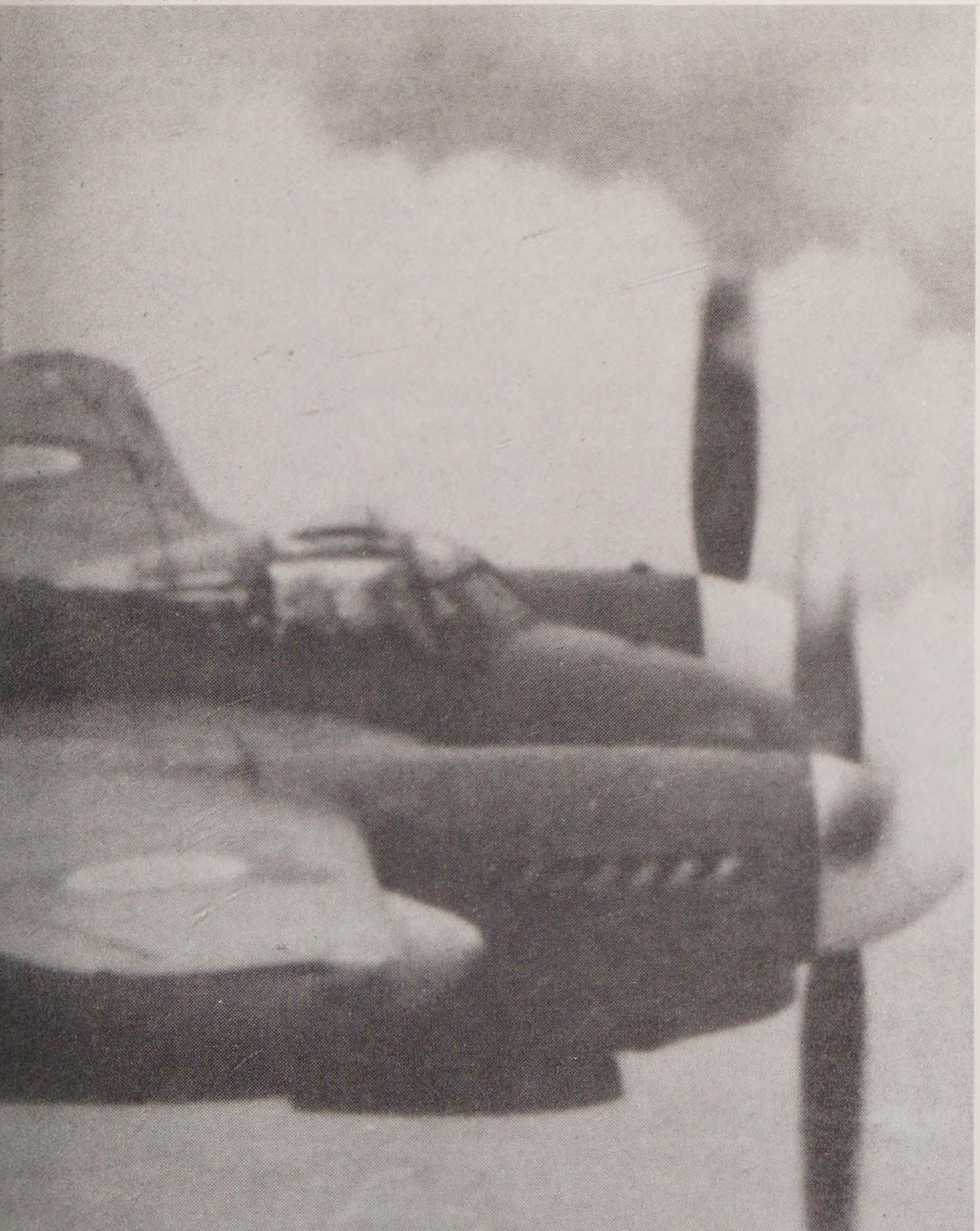
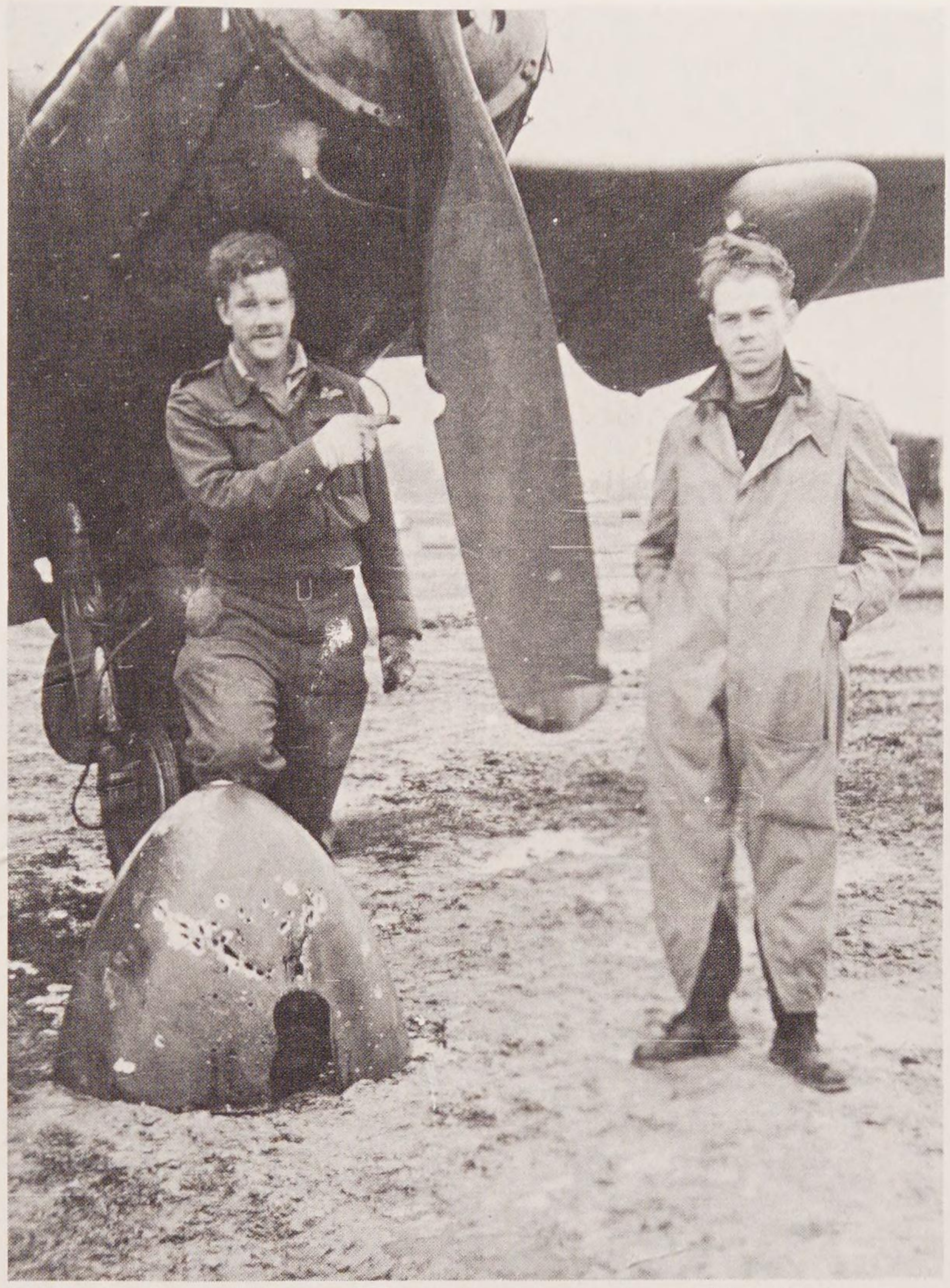
*Left.* **Mosquito PR.34s were used as navigational assistance to the No. 54 Squadron Vampires on their return from the USA in August 1948.**

They were supplemented in June by PR.IV DZ553, which was shot down on its seventh sortie on July 27, but the arrival of PR.IX LR411 and LR437 in August helped the Squadron to perform effectively, and four more MkIXs arrived in September. By this time they were operating exclusively on high-level photo reconnaissance all the way up into Italy, Austria and other parts of Southern Europe. A major operation was the photography prior to the Sicily invasion, which contributed significantly to its success. The unit's first PR.XVI, MM287, arrived in February 1944, the maximum strength of 13 Mosquitoes having been reached the previous month.

Flt Lt Freddy Andrews, having lost a job with 4 Squadron when they disposed of their Mosquitoes, was sent to Dyce to train with a South African pilot, Lt P. Stofberg. Soon after he went to Benson to collect Mosquito PR.XVI NS644 to fly out to 60 Squadron, SAAF, in Italy, in September 1944. The unit was based at San Severo, which they shared with 680 Squadron. The SAAF were short of navigators, so some were seconded from the RAF to help out. Also at San Severo were two American units flying Lockheed Lightnings, which were supposed to defend the Mosquitoes against the threat of enemy jet fighters from mid-1944, but found difficulty in keeping up with their charges. Freddy Andrews flew about 28 operations with the squadron, flying over the Balkans, Eastern Germany and as far up as Poland. Amongst the photo targets were a number of railway tunnels in the Balkans which were suspected of being used as underground factories, and from the photographs it was hoped to get a clue as to which ones were being used this way, and what was being made.

**Mosquito PR.XVI NS644 of No. 60 Squadron SAAF collected by Freddy Andrews and his pilot from Benson in September 1944.** *Mr. F. Andrews*

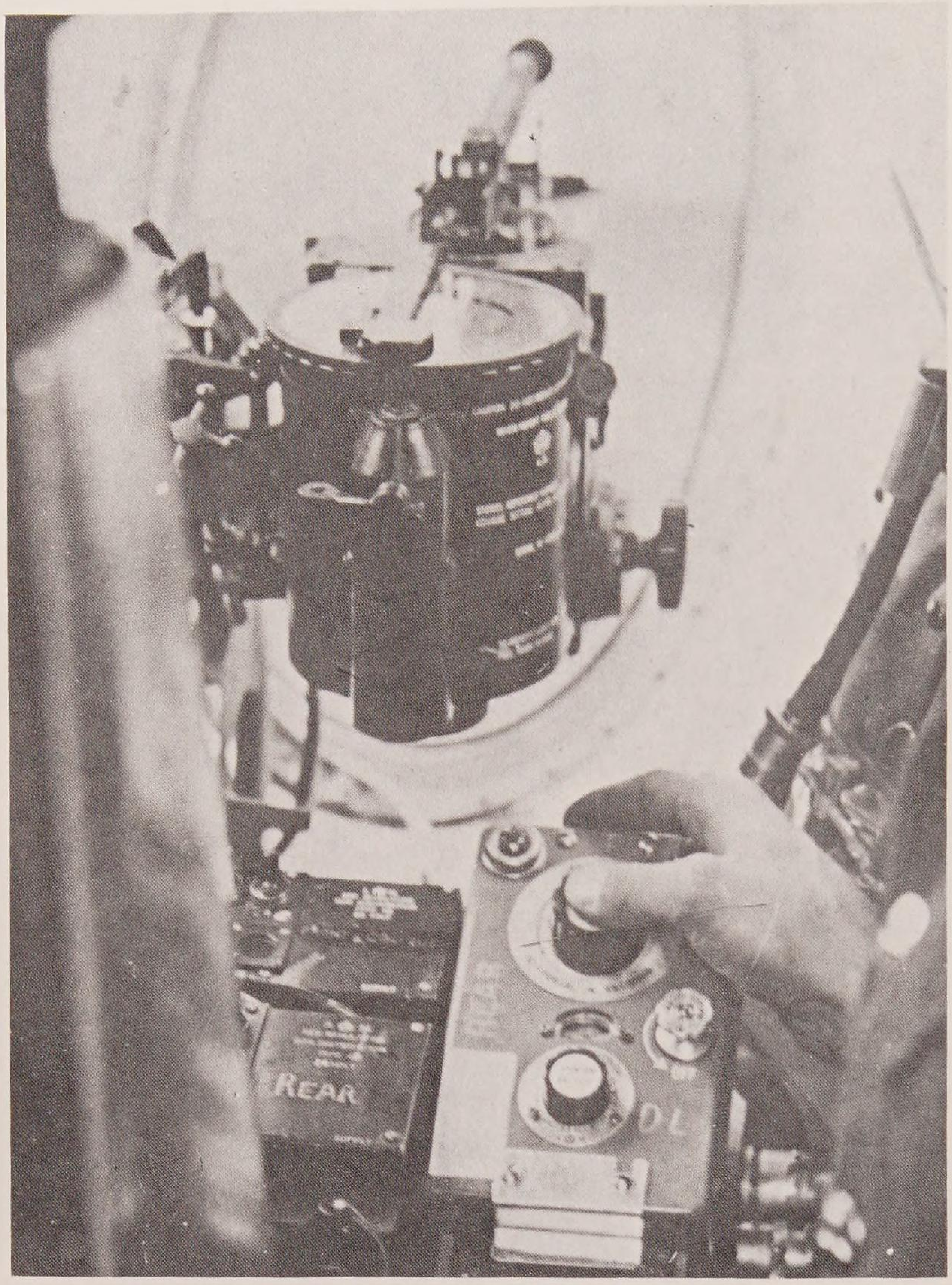




**Lt. P. Stofberg (left) and Flt. Lt. Freddy Andrews (right) after their force landing at Fano in PR.XVI NS649 following damage inflicted by an Me262.** *Mr. F. Andrews*

Normal height of operations was 8,229m (27,000ft), depending upon cloud cover and contrail altitude. Although flak was a threat, particularly when the aircraft were betrayed by a contrail, it rarely caused damage, the major problem being enemy fighters. Escorting Mustangs or Lightnings were often sent along to protect the unarmed PR Mosquito, but on longer flights, when the enemy Me 262 jet fighters were not expected to appear, these escorts were not sent. However, on one of these longer "milk runs" in NS649, over the Salzburg – Innsbruck area on November 26, 1944, just when Freddy Andrews was in the nose taking the photographs, there was a loud bang. Freddy returned to his seat like a rocket and found that an Me 262 had been following their contrail and had fired. The shells having hit along the top of the engine cowling, were deflected down by the propeller blade, and had gone into the reduction gear, causing a runaway. There was just enough power left to feather the engine, and the aircraft went into a rapid dive to escape into cloud at lower level. The Me 262 overshot the Mosquito twice in the dive, despite an estimated speed of around 804km/hr (500mph), but once the Mosquito entered cloud, the enemy aircraft was shaken off.

By this time the Mosquito was down to 2,743m (9,000ft) and ready to limp home, but the Alps formed a towering barrier between the aircraft and its base. It was necessary to clear at least 4,267m (14,000ft) in an aircraft with only one engine, which did not give the best climb gradient, so the pilot put the remaining starboard engine through the gate into maximum boost for half an hour – well above the recommended time – and climbed over the top. The weather was



**The navigator operated the cameras from the bomb aimer's position in the nose of the aircraft.** */IWM*

also bad over Italy, so they flew with the aid of Gee to overhead Fano and began to circle to find a gap in the cloud. Suddenly they spotted the airfield and, turning into the dead engine, they pushed down the nose and landed about 333km/hr (180kt), overshooting into mud at the end of the runway. The Mosquito went back on ops after the damaged engine was changed, but it was not long before the starboard engine also had to be replaced after its punishment over the Alps.

The navigator was responsible for operating the cameras over the target, and he lay in the nose of the aircraft, aiming through a bomb sight. Unlike bomb dropping, however, there was no need to press the button in advance of the target. During the remainder of the flight he was responsible for navigation, usually by map reading, and kept a lookout for other aircraft, friend or foe. A so-called friendly aircraft could often attack a Mosquito in error, so in addition to invasion-type stripes painted on the wings and fuselage, diagonal red and white stripes were painted over the fin and rudder as an aid to identification.

Another escape from an Me 262 by a 60 Squadron Mosquito occurred on August 15, 1944, when NS520, being flown from San Severo to Cunzburg and Leiphein by Capt Pienaar, was intercepted at 9,144m (30,000ft). In a 90-mile running battle the Mosquito had its port flaps, port aileron, the rear of an engine nacelle, the fuselage tail cone and much of its port tailplane shot off. Despite the loss of 3,353m (11,000ft) of altitude in the initial attack and the reduction in speed due to the damage, the Mosquito survived twelve attacks lasting nearly 40 minutes and made a wheels up forced landing in Italy, the two crew being immediately awarded the DFC.

No 60 Squadron completed its war service with mapping survey flights of Austria, the French-Italian border and the Italian Alps. With the end of the war in Europe, the squadron was ordered to carry out a large-scale, mapping survey of Greece, the Aegean Islands, Southern Italy, Sicily, Corsica and Sardinia. The official stand-down came on July 15, and in August ten of the unit's Mosquitoes were flown from San Severo to Zwarkop in South Africa, where they were put into storage and subsequently seldom flown.

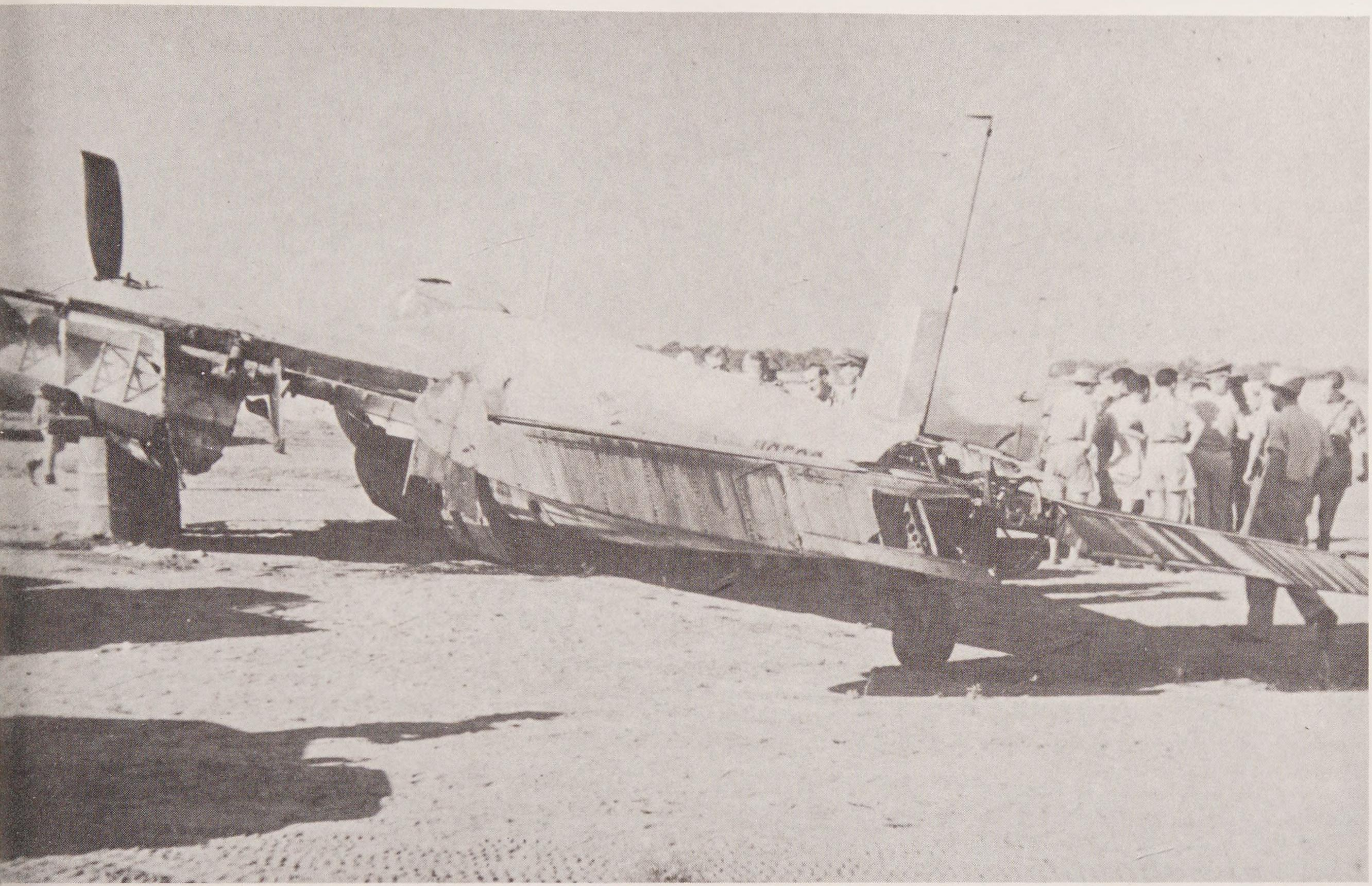
Also in the Mediterranean, 683 PR Squadron began Mosquito MkII operations over Southern Italy from Malta in February 1943, but only 20 sorties were flown, commencing on May 13, before the aircraft were withdrawn. In the summer of 1943, the first three PR.IXs were detached from 540 Squadron to the Mediterranean, and a PR.XVI was sent to Gibraltar in January 1944 to check out the two-stage Merlin operations in the warmer climates. In February 680 Squadron began to replace its Spitfires with Mosquitoes, and by the end of April 1944 had one PR.IX and nine PR.XVIs. Greece and the Balkans were the squadron's main area of operations, complementing 60 Squadron's coverage of Italy and Southern Europe. Like 60 Squadron, 680 Squadron received escort support from the Mustangs and Lightnings of 31st Fighter Group USAAF as their flights ranged up into Austria and Bavaria.

With the ending of the European war, Mosquito PR.XVIs and PR.34s continued to operate throughout the Middle East, mainly on civilian mapping and survey duties, but also served in a more active role during the Palestinian emergency. By this time Freddy Andrews had joined 680 Squadron, and flew with them to Iraq, where they lived in comparative luxury and high temperature, their tasks being mapping survey flights over the featureless desert.

The last operational area was Asia, where the first PR Mosquito joined 681 Squadron at Dum Dum on August 2, 1943. Operations commenced on August 23, with DZ697 covering the Mandalay, Shewbo-ye U-Monywa and Wunthe area. A further PR.VI, HJ730, was delivered the following month, but DZ696 force-landed close to enemy territory with bullet holes in both oil tanks. Despite a lack of spares, illness and torrential rain, new engines and undercarriage were fitted in three weeks and the aircraft was flown out from a jungle strip.

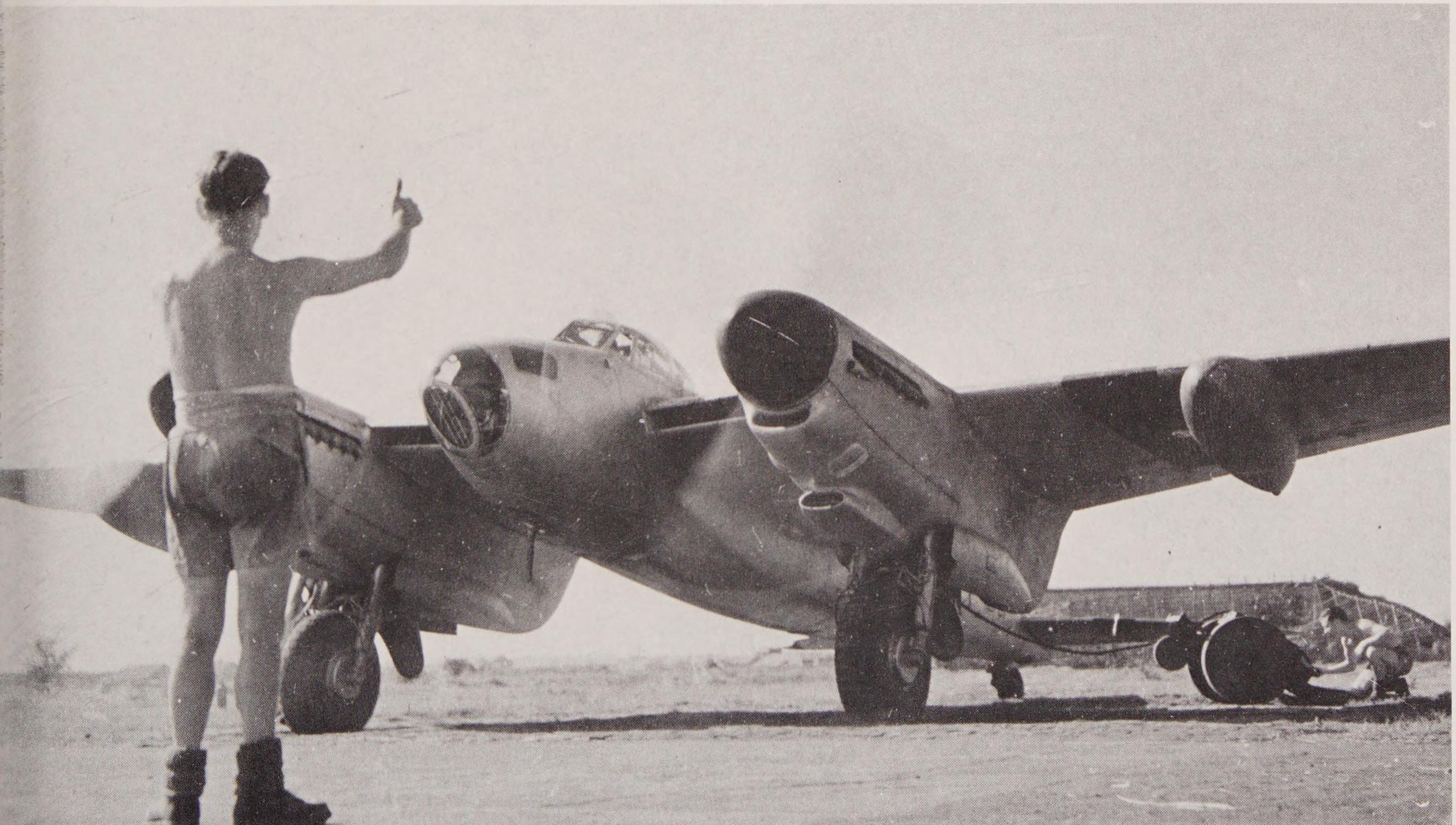
Up to six Mosquitoes, varying in age, were sent out to India, to be picketed out in various regions to check the life of the structure in hot and humid climates. The aircraft stood up surprisingly well to temperatures up to 130°F, humidity at 88 per cent and a rainfall at 63.64in.

In early September the first PR.IX, LR440, was delivered to 681 Squadron, its first sortie over Rangoon and Magwe being flown on October 21, but the Mosquitoes were withdrawn from the Squadron at the end of the month. However, 684 Squadron formed at Dum Dum the next day, equipped with a mixture of Mitchells and Mosquito Mark II, VI, and PR.IX, commenced operations on November 1. The Mosquito build-up was slow, and the majority of the sorties were of very long duration, but the aircraft behaved very well and did an effective job. On December 9, 684 Squadron moved to Camilla, making very long range flights to northern Thailand, northern Burma and the Andamans. Most reconnaissance flights were at high altitude, between 8,534 and 10,058m (28,000 and 33,000ft). By January 20 Mosquitoes, consisting mainly of MkVI and PR.IXs were on unit strength, but the following month the first three XVIs arrived, gradually replacing the earlier aircraft. Deep penetration mapping flights were made over Burma and Siam, one of the longest flights being 3,630km (2,256 miles) to Nancawry, taking 7hr 20min at an average speed of 495km/hr (308mph). These long duration flights underlined the need for the long-range PR.34s. By mid-1944 Australian-built Mosquitoes were covering the



Damage to Mosquito NS520 after being attacked by an Me262 on August 15, 1944. The tailplane, tailcone and port flaps were severely damaged. */WM*

A Mosquito PR.XVI starting up on a Bengal airfield ready for another sortie. */WM*



territory as far west as Sourabaya, but a gap of 3,218km (2,000 miles) of Japanese territory existed outside the Mosquito's range.

Long range records continued to be broken. A 3,781km (2,350 mile) flight in January 1945 took 8hr and 20min, but this was soon beaten by a 3,996km (2,483 mile) flight through tropical storms, giving extremes of heat and cold. After more than 8hr airborne enough fuel remained for 20 min after landing. Perhaps one of the longest flights was that made by NS675 to Paket Sound on March 9, which lasted 8hr 48min. The ultimate recorded long duration trip was a 4,184km (2,600 mile) round trip from the Cocos Islands over Penang and Taiping on August 20, 1945, which took just over nine hours.

On June 16 Mount Everest was the photographic target, and as the aircraft arrived, the peak cleared of cloud, providing an excellent opportunity for good pictures. Circling for about 20min, and using 14in cameras mounted in the wing drop tanks, a picture was taken every 1½sec at 1/300th of a second, and as the aeroplane departed the pilot flew past the peak, at about 9m (30ft) distance.

The PR.34s entered service with a special detachment of 684 Squadron, based in the Cocos Islands, in June 1945, the first very long range mission being flown on July 3 by RG185. George Bunyan was an airframe fitter in the Cocos Islands, which were situated about 2,414km (1,500 miles) from Ceylon and 1,931km (1,200 miles) from Australia. He was part of the advance party sent to the uninhabited island to clear the coconut palms and prepare the coral landing strip. The aircraft operated reliably in the hot climate and salty air, all fuel and supplies being brought in by sea and ferried in from offshore ships. George remembers that some of the personnel were lost when they made a raft from Mosquito drop tanks and floated out to sea, not realising that the tanks were only made of paper.

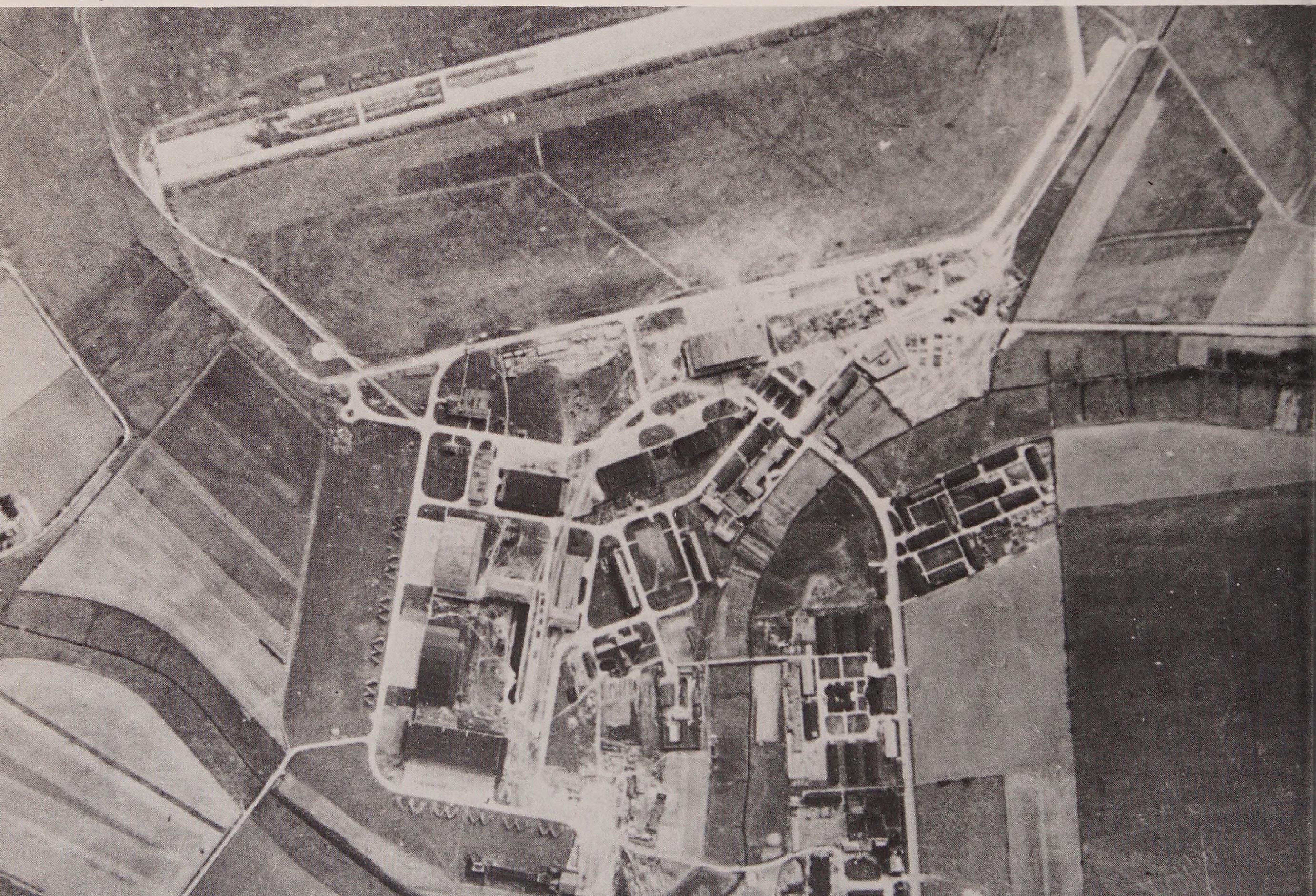
The main hazards over Malaya were flak and thunderstorms and 13 sorties were flown by VJ Day, a total of seven PR.34s being based in the Cocos by the end of August. The longest flight from the Cocos Islands was made by RG210 on August 20, when 4,184km (2,600 miles) were flown over Penang Island and Taiping, taking over 9hr and 5min.

The final RAF Mosquito tasks were photo reconnaissance sorties over the Malayan jungles during Operation "Firedog" by Mosquito PR.34s of 81 Squadron. These operations commenced in July 1949, shared between Spitfires and Mosquitoes, and continued for some seven years. The last Mosquito operational flight in the Far East and indeed in the RAF, was flown by PR.34 RG314 on December 15, 1955, thus closing a major chapter in the history of the Service.

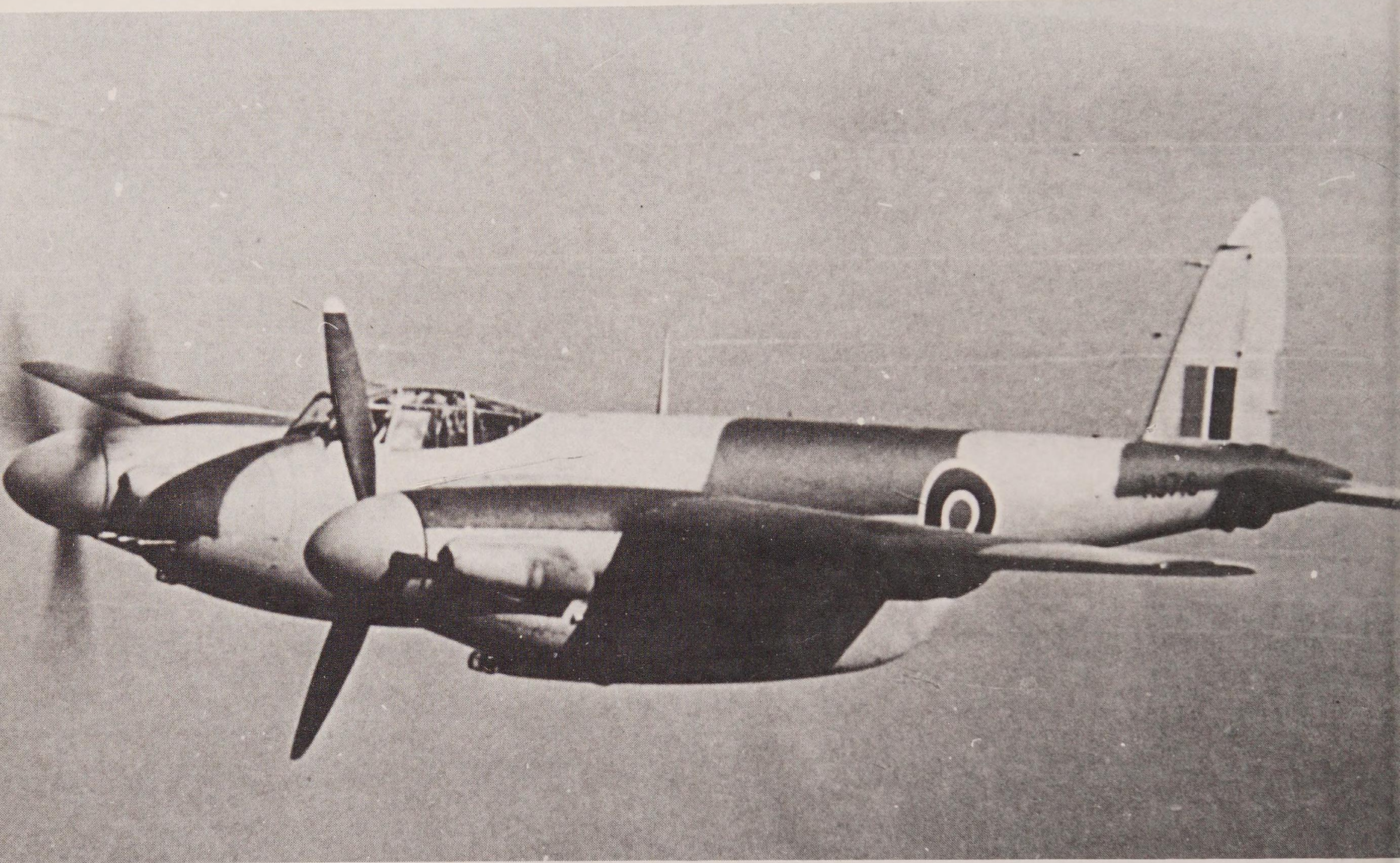
The Australian factories had produced the Mosquito PR.41, and some of the Mk40s were also converted to PR work, fitted with three vertical cameras in the nose and two obliques. These aircraft were used by 87 (PR) Squadron RAAF on an aerial survey of Australia which commenced in 1946 and terminated when the Squadron was disbanded in 1953, after two thirds of the country had been covered.

The Mosquito had proved its worth, bringing back pictures in all climates and conditions, by day and night, and surviving many sorties despite its lack of defensive armament. It had kept our planners informed of enemy activity, and its wooden structure stood up well to both extremes of climate and battle damage. The Mosquito achieved all that was expected of it and more.

**Typical PR Pictures before and after a raid, in this case the Fw190 factory destroyed by 8th Air Force USAAF B-17s.** ***IWM***



# FIGHTER BOMBER OPERATIONS



## 2nd Tactical Air Force

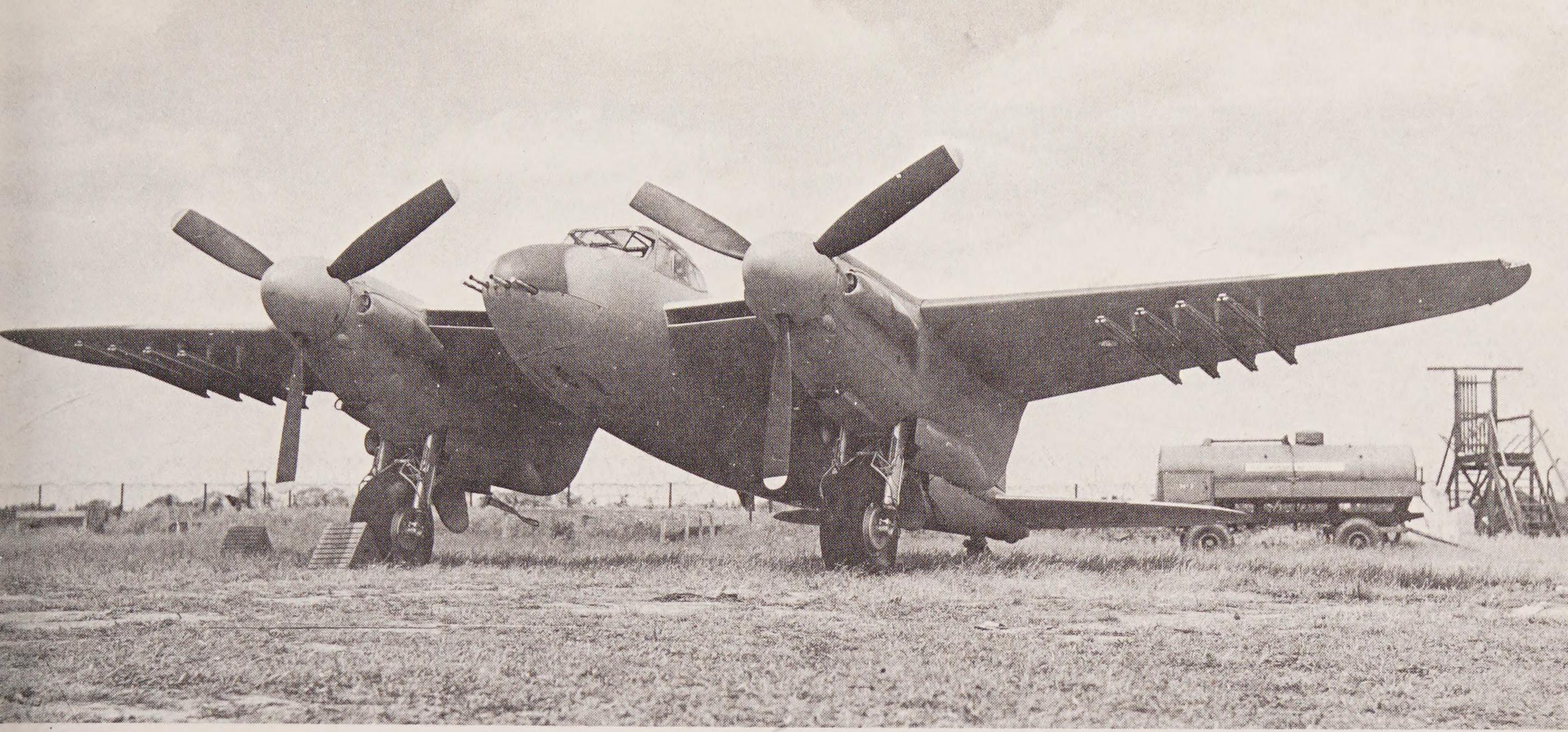
More Mosquito FB.VIs were built than any other version of the aircraft. Conceived early in the Mosquito's life this variant remained in production from its first appearance in May 1942 until after the war. The only development was the ship-busting MkXVIII tse tse.

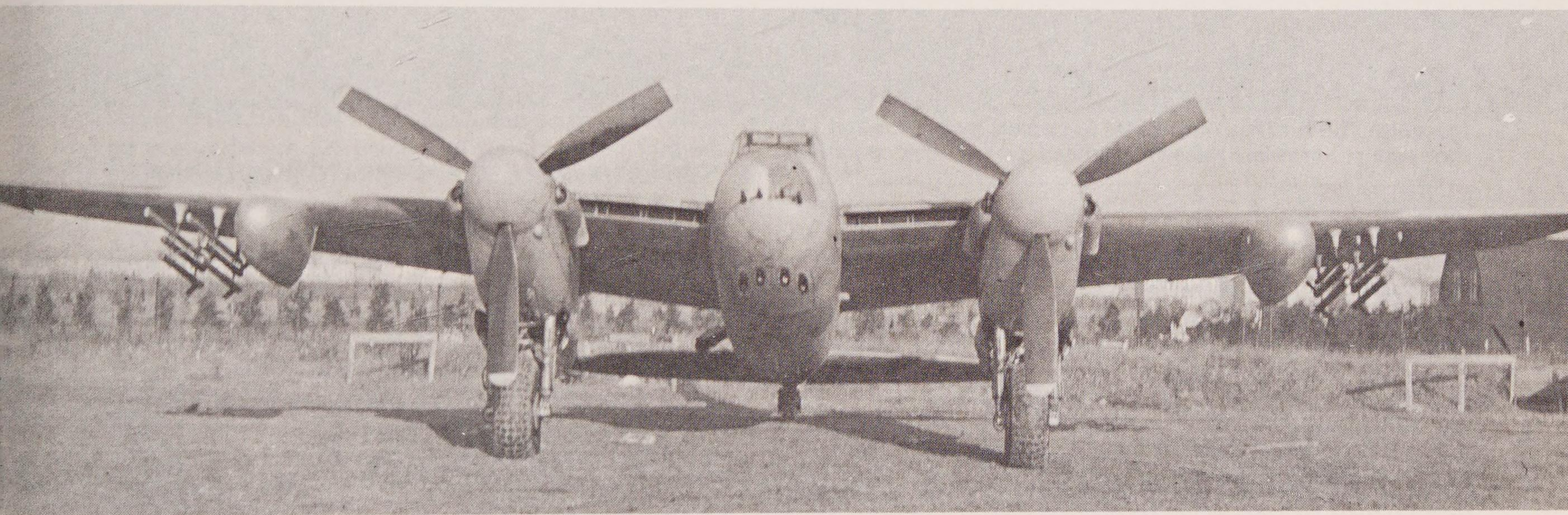
The go-ahead for the Fighter-Bomber version was given in July 1941, and production B.IV DZ434 became the MkVI prototype HJ662/G. Delivered to the A & AEE Boscombe Down on June 13, 1942, it was written off on July 30 when it hit two Beaufighters following an engine failure on take-off. After some delays the first production aircraft appeared in February 1943. Early deliveries were to 418 Intruder Squadron at Ford in May, followed by 605 Intruder Squadron at Castle Camps in July and 23 Squadron in Malta, where it replaced their F.IIs.

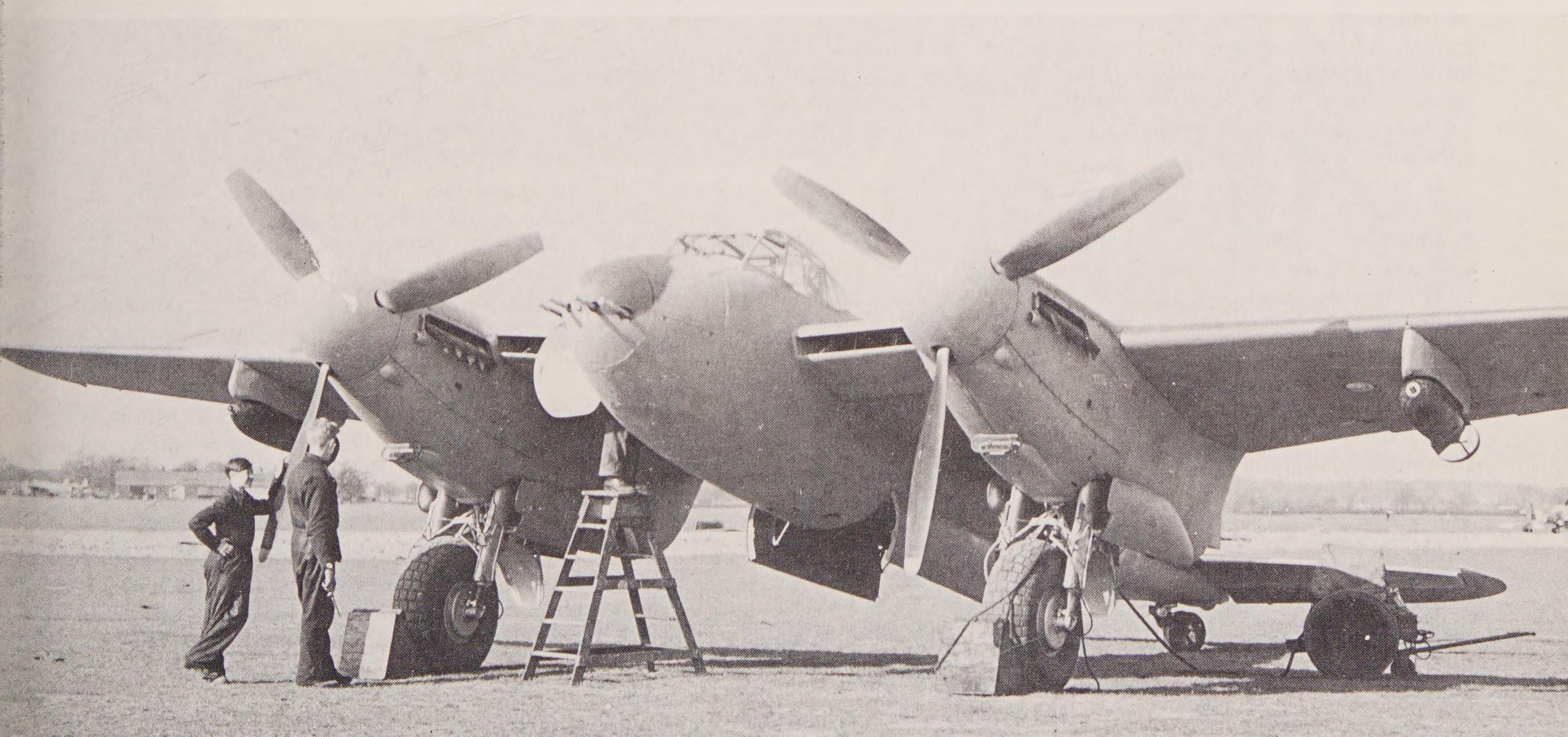
The 2nd TAF was formed in June 1943, and consisted initially of 464 (RAAF), 487 (RNZAF) and 21 Squadrons. The two Colonial Squadrons had been flying Lockheed Venturas, but moved from Methwold to Sculthorpe where, on August 21, each received two Mosquito FB.VIs. A conversion flight was formed to train the crews, which went on to convert the crews of 21 Squadron, thu completing the Sculthorpe No 140 Wing. Within a month, 46 Squadron were able to put a dozen Mosquitoes in the air, and by th end of September the airfield was crowded out with more than 70 o the new aircraft.

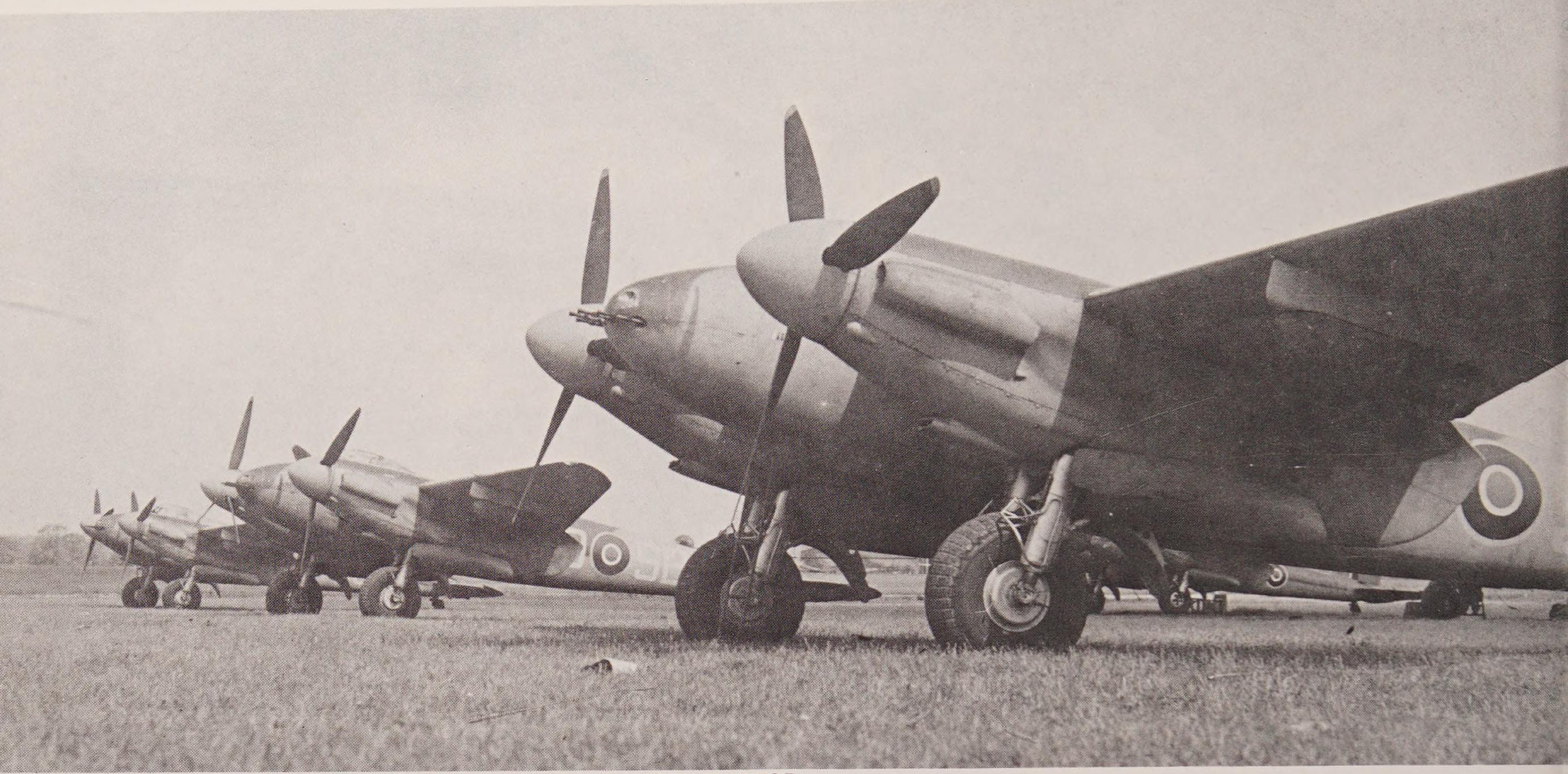
The station commander was the well-known Gp Capt P. C (Percy) Pickard DSO, DFC, who intended to play an active part b flying as Wing Leader, amassing ten hours' flying conversio training at Hatfield. The Wing was pronounced ready for th operations on October 2, 1943, and commenced active sorties th next day when 487 Squadron, led by Percy Pickard, and 46 Squadron, led by Wg Cdr Meakin, despatched a combined force two dozen Mosquitoes. The 2 Group AOC, AVM Basil Embry, an his SASO David Atcherley, crewed one of the tail end aircraft. Eac Mosquito carried four 500lb bombs, the leading attack on Po Chateau power station near Nantes being made at tree top heig with 11-second delay fuses. The second wave delivered their bomb in a shallow dive attack from 609.6m (2,000ft), releasing them a 244m (800ft). Six Mosquitoes were damaged, including Pickard'

*Opposite.* **Mosquito FB.VI alternative loads: 1: PZ202 and four RP racks under each wing. 2: PZ202 with paired RP and fuel drop tanks 3: LR356 with underwing bombs.**









**Mosquito FB,VIs of No. 464 (RAAF) Squadron, part of the 2nd TAF, took part in the Amiens Prison raid amongst many other operations.**

aircraft, which returned to Predannack on one engine and with a lump of shrapnel in the other radiator.

Their next sortie, six days later, was not so successful, owing to very bad weather conditions, and the low-level flying brought the hazard of bird strikes. Only two aircraft, one each from 464 and 487 Squadrons, reached the target, an aero engine factory at Woippy near Metz, most of the formation having lost contact in the mist and low cloud. Wg Cdr Wilson, the leader of 487 Squadron, was one who found the target, but his navigator was killed by flak. Two aircraft blew up when they inadvertently released their bombs (which were without delay fuses) at low level en route, and at least two more aircraft were lost. There was obviously a need to concentrate on low-level training before any more similar attacks were attempted, but a return to operations was made on November 5. 21 Squadron carried out its first operation on November 10, but this was aborted because of bad weather.

To take advantage of the night intruder experience gained by 418 and 605 Squadrons, 464 Squadron was split between Ford and Bradwell Bay to undergo night flying training during October. The unit started to use its new skills on November 19.

The establishment of a second fighter bomber wing, No 138, commenced at Lasham on October 14, 1943, when six crews from 613 Squadron were attached to Sculthorpe to gain Mosquito experience. Two days later the first T.III was delivered by a woman pilot of the Air Transport Auxiliary. On October 19, Sqn Ldr R. N. (Bob) Bateson arrived to command the squadron, and training continued throughout November and early December, ready for the first sortie on December 19. 613 Squadron was later joined by 107 and 305 Squadrons to complete the Lasham Wing.

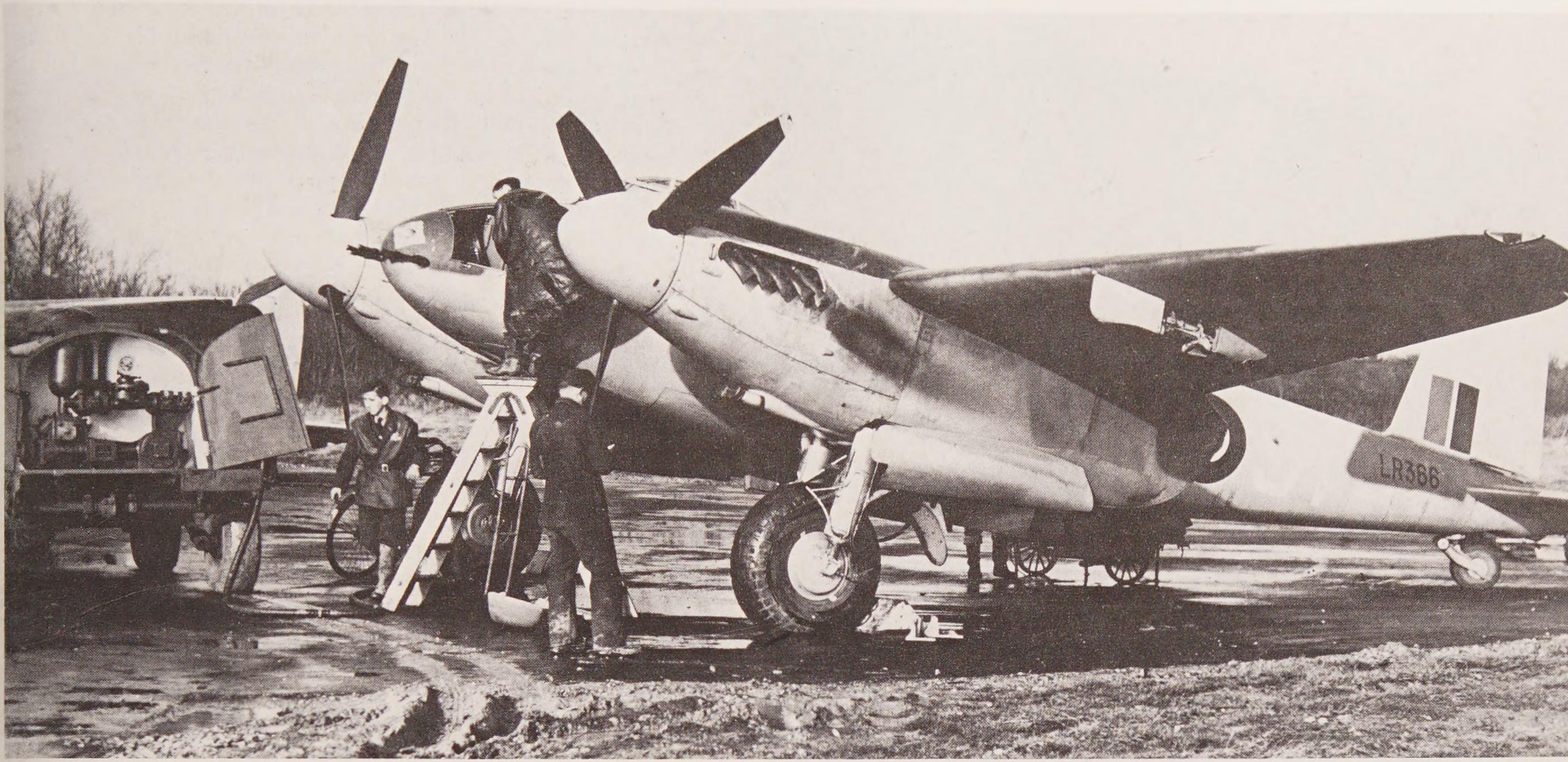
Meanwhile, No 21 Squadron began "Day Rangers" on November 25, when a pair of aircraft attacked the transformer station at Vannes. Similar attacks followed, some using "Gee' as a navigation aid, until December 10th, when they were stopped for the time being. During this period 464 Squadron was engaged or "Flowers", flying from Ford and Bradwell Bay and building up thei night intruder experience against enemy night fighter airfields.

Then came the offensive against the V–1 sites, into which a variety of Mosquitoes were pitched, including fighter bombers and night fighters. These attacks commenced on December 21, 1943 when 29 aircraft from the Sculthorpe Wing set out to attack a site a St Agathe but turned back due to cloud over the target. These prickly targets tended to be well defended. Some of the Mosquitoes sustained heavy damage, although they were still able to bring thei crews home safely. A major V–weapon site attack occured on December 31, the Sculthorpe Wing aircraft returning to their new base at Hunsdon, which was closer to the action. 613 Squadron participated for the first time on this raid to gain first-hand experience.

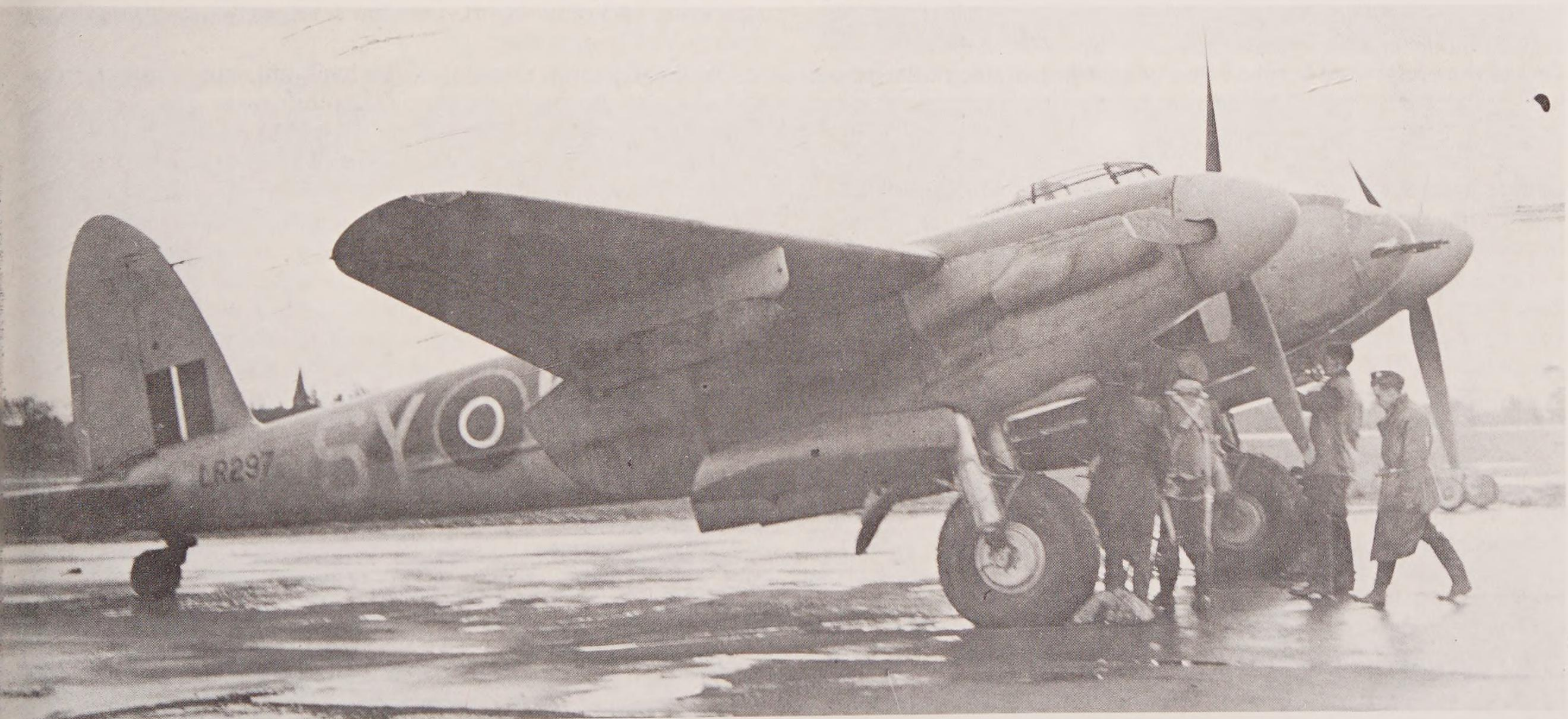
During January 1944 the V–weapon sites continued as targets, 4 raids being mounted by 21, 487 and 613 Squadrons in day attacks 464 Squadron commenced "Night Rangers" on January 2 attacking enemy-occupied airfields in France. In addition to thei heavy defences, the V–1 launch sites were difficult to find and were located in friendly territory. The techniquè of attack, developed from the early days, was to fly low over the Channel, pull up to 1,524 – 1,828m (5 – 6,000ft) and make a diving attack with bomb release a about 457m (1,500ft). Not only were the launch sites well hidden amongst trees, but decoy sites were built to mislead attackers. These difficult targets often needed up to 100 Mosquito sorties to destroy them, but despite a number of aircraft damaged losses were as low a 1.53 per cent.

The Polish-crewed 305 Squadron exchanged its Mitchells for it first Mosquito on December 4, 1943. Its first operation against V–site on January 25 aborted, the first success coming three day later. The unit was joined at Lasham by 107 Squadron in Februar 1944, which took an active part in operations on March 15. Durin this time each squadron took its turn at spending a month on nigh operations. Meanwhile, the damage to the V–1 launch sites delayed their launch until at least June 1944 and saved many civilian lives

On February 18th, 1944, came the famous Amiens Prison raid


**No. 613 Squadron FB.VI LR366 during operational turn round at Lasham.**

**N0. 613 Squadron FB.VI LR297 on return from a sortie at Lasham in January 1944.**



Operation "Jericho". In the Somme area and plains of Picardy, as in all the other occupied areas of Europe, there was an active Resistance, supported by manpower and equipment supplied by the Allies. Led by a formidable trio, the brothers Dominique and Pierre Penchardier and an ex-communist known as Pepe, the Amiens area was administered efficiently and secretly, but in such a situation the less wary were exposed by traitors and imprisoned in the forbidding prison. Some had been caught in the act of sabotage while others had been betrayed by collaborators, and the persuasive methods used by the Gestapo put the whole operation at risk.

The network had been started in October 1940, and was concerned with sabotage of the German war effort and the continued freedom of those suspected of being in the organisation. One particularly effective member was 20-year-old Jean Beaurin,

**One of the underwing bombs being winched up to its pylon.**

who managed to cause five major train crashes which killed and injured many hundreds of German troops. He was caught and imprisoned at Amiens towards the end of 1943. By December 1943, twelve members of the Resistance organisation had already been shot in the prison, and Beaurin awaited the same fate with very little chance of rescue. Then another senior member of the team, who unfortunately had a half map of the prison plan in his possession, was caught while planning a rescue attempt, thus alerting the Germans. The final blow was the arrest of Maurice Holleville, who was caught trying to acquire ration cards. So clandestine was the existence of these men that, according to the authorities, they did not exist and were therefore unable to qualify for such essential items as ration cards.

The leaders of the organisation had pledged to help each other, even if it cost them their lives, but an attack on the prison would effectively wipe out their already infiltrated network. Then they heard that their colleagues and about 100 others were to be shot on February 19th.

The only alternative was an attack from the air, so Dominique Penchardier began to send all the relevant details of Amiens prison to London, without giving any reason. He was biding his time, and continued to add the minutest of details so that everything possible was known about the prison layout, structure, defences and duty rotas. Fortunately, the stimulation he needed came when two allied intelligence officers were captured and joined the other inmates of the prison. This was the moment to request the daring attack on the prison, and all the details were already in the hands of the RAF. The plan was passed to the 2nd TAF, and AVM Basil Embry had to decide whether Mosquitoes could be used on a raid to rescue about 700 prisoners, many of whom were members of the Frenc Resistance. Loss of life amongst the prisoners was inevitable especially as the guards and defences had to be neutralised, but th prisoners would at least have a chance to escape.

The prison was in the form of a crucifix surrounded by a 6m (20ft high glass-topped wall which was three feet thick. The guards wer in a separate building attached to the prison, the approaches wer lacking in obstructions and the target was beside the long, straigh road to Albert. A fine balance had to be set on the amount o explosive used on the walls, since too little would fail to breach the and spring the cell doors, and too much would cause excessiv casualties. Timing was essential, as midday was when the prisoner assembled for lunch. In the block adjacent the guards also lunche at that time, providing the best opportunity to eliminate as many a possible.

The operation was ready to go at any time from February 10. Basi Embry was to lead 140 Wing on this low-level raid, with Perc Pickard as his number two, crews being selected from all thre squadrons and close support being provided by the Typhoons of 19 Squadron. 487 Squadron were to bomb the guardroom and breac the outer walls in two places to allow the released prisoners out of th compounds. 464 Squadron were to place their bombs against th prison walls, and if no prisoners were seen to escape, then 2 Squadron were to carry out the horrifying alternative of destroyin the prison and all those in it, as requested by the inmates. However in the interests of secrecy, very few of the prisoners knew of th planned attack.

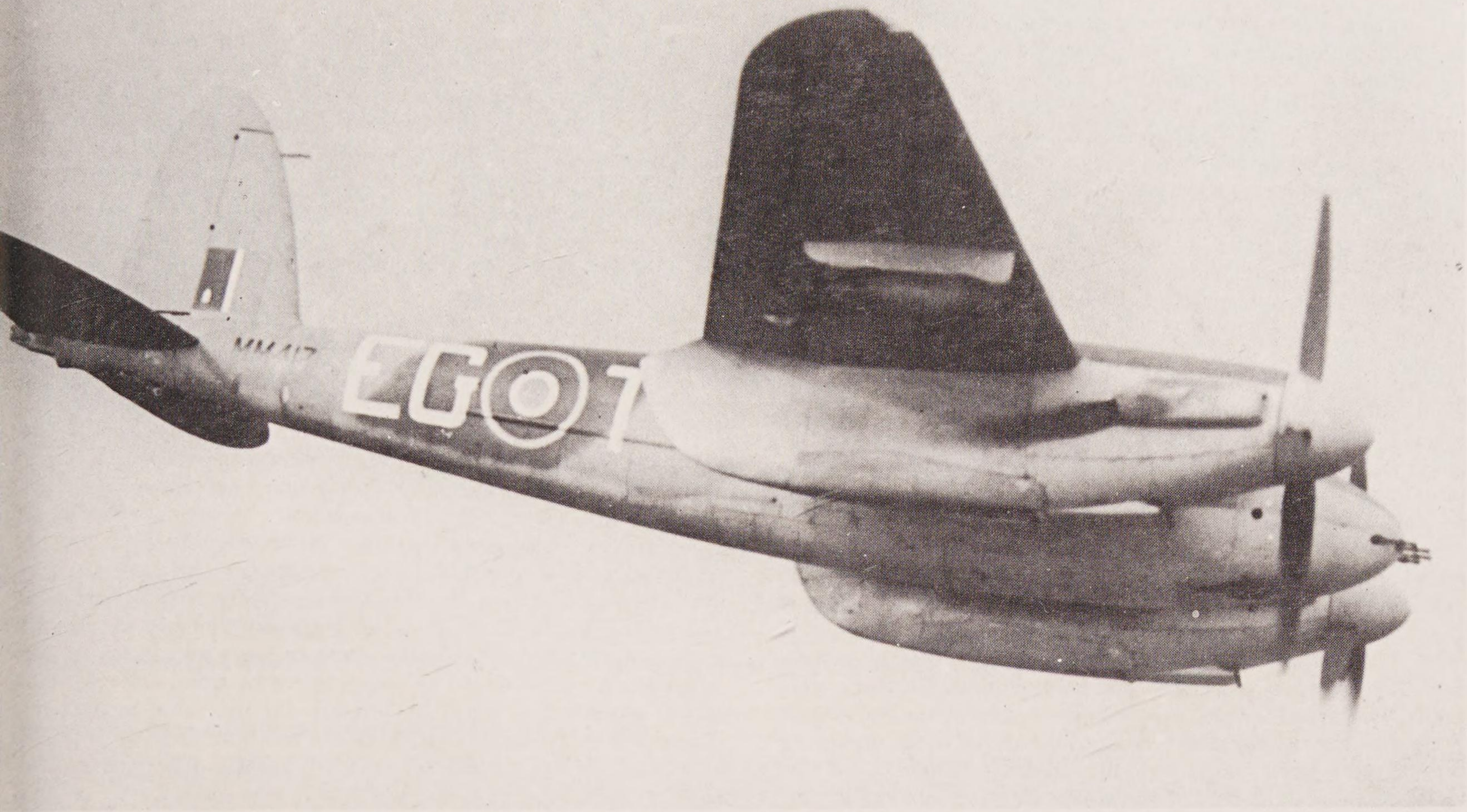
Then came the first set-back. Basil Embry was forbidden to go o the raid, and after much heart-searching he had to allow Perc Pickard to take over despite his relative inexperience in low leve attack; he had only six previous low level sorties to his credit, al against V–1 launch sites.

The weather was abysmal, with cloud and snow across Europe and during training a number of aircraft were damaged in th unfamiliar hands of some of the crews. Even Pickard was no immune to these problems, as he suffered a bent tail-wheel.

After February 10th the weather became even worse, an although an improvement was expected from the 14th this did no materialise, and the deadline grew closer. With the arrival of th 18th further delay was out of the question. A total of 18 Mosquitoe was to be used in the attack, with an additional Film Productio Unit Mosquito to record the operation. The briefing commenced a 08.00 with a more than customary security cloak, and a model of th prison was shown to the crews to give them their first knowledge o their target. Surprise and accuracy were essential for success, an Grp Capt Pickard was to be the last man in, on the second wave, s that he could assess the success or failure and call in 21 Squadron i necessary. Minimum time was to be spent in the target area to avoi the risk of extra losses due to defending fighters or the bad weather Alan Broadley, Percy Pickard's close friend and navigator discussed the route details with the other navigators. In case o anything happening to Pickard over the target, the crew of the Fil Unit Mosquito were to assess the situation and advise the reserve 2 Squadron .

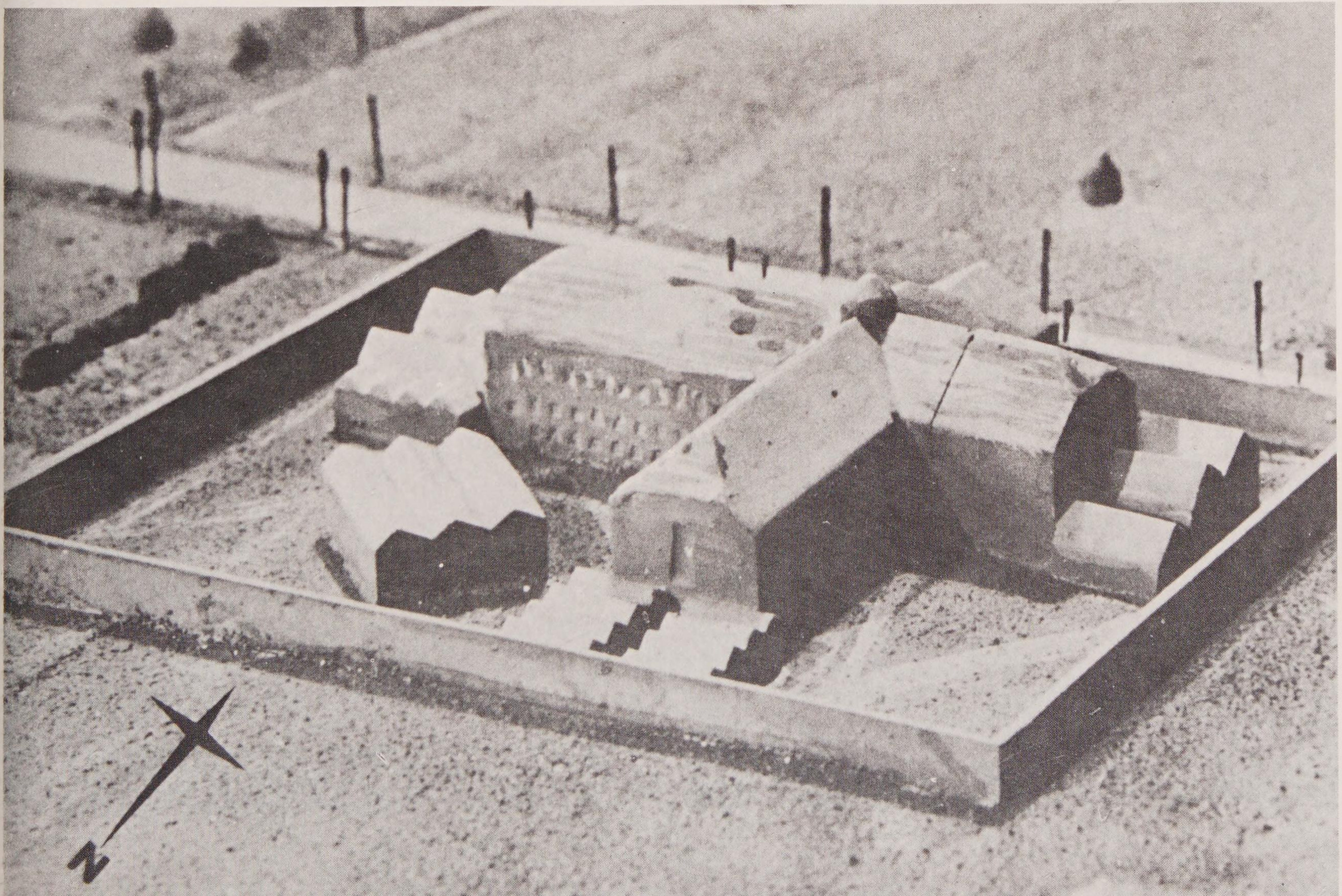
Despite there being no improvement in the weather ove Southern England, there were prospects of brighter conditions ove the Channel and the target area. Any postponement to wait for weather improvement would have been pointless, so Pickard mad the decision to go with only two hours to the deadline, and th operation finally got under way.

The Mosquitoes took off into the gloom over Hunsdon's humpe runway and ascended into worse weather conditions than many the crews had experienced. As a result, four aircraft soon lost contac with the formation and had to find their way back home. However as had been hoped, a break in the cloud appeared over the Channe



Mosquito FB.VI MM417 EG-T:487 Squadron (RNZAF) with a 500lb bomb carried under each wing. This aircraft was possibly used on the Amiens Prison raid. */WM*

The wooden model of Amiens Prison, used at the briefing prior to the operation. *Crown Copyright*



and the operation appeared to be possible. A further aircraft then had to drop out of the leading wave owing to engine trouble, leaving nine aircraft in the main attack and four in reserve.

At noon the members of the resistance walked unobtrusively outside the prison, as they had done for some days, ready to help spirit the escapers away. With no sign of the attacking force, hope was sinking and then, at one minute past twelve, black dots appeared through the murk, coming in low. Three of the 487 Squadron aircraft aimed for the prison to drop their eleven-second delay bombs, the remaining two making a diversionary fake attack on the nearby railway station before coming back over the prison. One of the New Zealand pilots still remembers seeing his hole appear in the outer wall. 464 Squadron were too close behind and had to circle to give the earlier bombs time to go off before they planted their salvoes.

Inside the prison all hell was let loose, a direct hit on the guard house killing or severely wounding all the occupants. As expected, many of the prisoners were also killed or wounded, trapped by the masses of falling rubble, but many were able to escape. Unselfish people like Dr Mans and a number of others struggled to rescue as many of the trapped and injured as possible and to tend the wounded. For these heroic acts, most of them were to die in front of firing squads. Others were carried out injured and spirited away to safety, the prison records having been destroyed, thereby making their identification more difficult. Even injured Germans were helped where possible, and the confusion caused by the two aircraft flying over the railway station delayed the arrival of the occupying forces by about two hours. With them came the Gestapo, the plan being to eliminate the survivors after finding out what they could about the raid. During the month of April, some 260 survivors were shot and buried in a defence ditch in Arras. Their bodies were located during the autumn.

Pickard circled at 152m (500ft) above the prison, watching the escaping figures in the snow, and just above the prison flew the Film Unit Mosquito, making three of four runs. Pickard signalled to 21 Squadron to depart for home. It was his last contact. As he turned for home he saw another Mosquito lose height and make a crash landing at high speed in open country. The navigator was dead before the crash, but the pilot was thrown clear and made a prisoner-of-war.

Pickard's aircraft was then attacked by an FW.190, its fire cutting through the rear fuselage and severing the tail of the Mosquito (HX922, coded EG–F for "Freddie"). Totally out of control, the Mosquito fell to the ground, killing the two crew instantly, and bursting into flames. Local people were rapidly on the scene but there was nothing they could do for the gallant crew. It was some two months before confirmation of their death reached Britain.

At the final count of the Prison occupants the total killed amounted to 87, which must have included a fair number of Germans. 182 prisoners were recaptured, but 255, half of whom had been awaiting execution, managed to escape. The remaining prison occupants had not been released from their cells. The raid was a classic demonstration of what could be done by precision attack based upon careful planning and attention to detail.

Following this spectacular operation, high-level attacks then followed, often led by Wg Cdr Iredale. The targets, hit by day and night, varied from factories and enemy airfields to V–weapon sites.

The next special low-level attack was made by 613 Squadron from Lasham, led by Wg Cdr Bateson, on April 11, 1944, when the Dutch Central Population Registry was to be eliminated without damage to the surrounding property. Six aircraft took part, flying low over the North Sea and climbing to 1,219m (4,000ft) for the crossing of the coast before dropping again to very low level, where birds, trees and chimneys were hazards. The 29m (95ft) five-storey building was hit by the first two aircraft, carrying 30-second delayed action 227kg (500lb) bombs, and they were followed by the third an fourth, carrying incendiaries. The fifth carried a mixture of bomb but the sixth aircraft suffered a snag and was only able to tak photographs of the destruction before the return flight.

On April 12, 613 and 107 Squadrons jointly attacked locomoti sheds at Hursan and both 487 and 464 Squadrons also had railwa installations as targets, while the Poles of 305 Squadro concentrated on night raids, commencing intruder attacks in earl April and working with 21 Squadron, which had commence intruder operations early in March.

At the end of April a series of experimental high-level attacks wer made on V–weapon sites by 21 and 464 Squadrons, led b Pathfinding Mosquitoes, followed by an attack on Abincou railway installations from 6,096m (20,000ft). In the eight month from October 1943 until May 1944 about 1,600 sorties had bee flown on 155 day bombing operations, for the loss of 36 aircraft.

The 2nd TAF Squadrons then eased off to conserve their strengt for their major thrust at D-Day. Preparations were being made for rapid move to the continent as soon as airfields were available, an No 511 Forward Repair Unit was ready to keep the aircraft in th air. Black and white identifying invasion stripes were painted acros the wings and around the rear fuselages ready for the attacks commence on the German communications network during th night of June 5-6, 1944, all six squadrons being fully involved. Th Mosquitoes concentrated on stopping enemy troop movements night, while other 2nd TAF aircraft did the same in dayligh Targets were illuminated either by the Mosquitoes or by Mitche of 98 and 180 Squadrons, the offensive mixture comprising 227k (500lb) bombs and cannon shells to keep the heads down. With superhuman effort by groundcrews, 93 per cent serviceability wa achieved in the first two weeks and 85 per cent subsequently. Losse were half of the expected rate, with 26 Mosquitoes shot down durin 2,000 sorties. Late in July underwing rockets were used on th Mosquitoes for the first time, and proved to have a high destructi effect on trains.

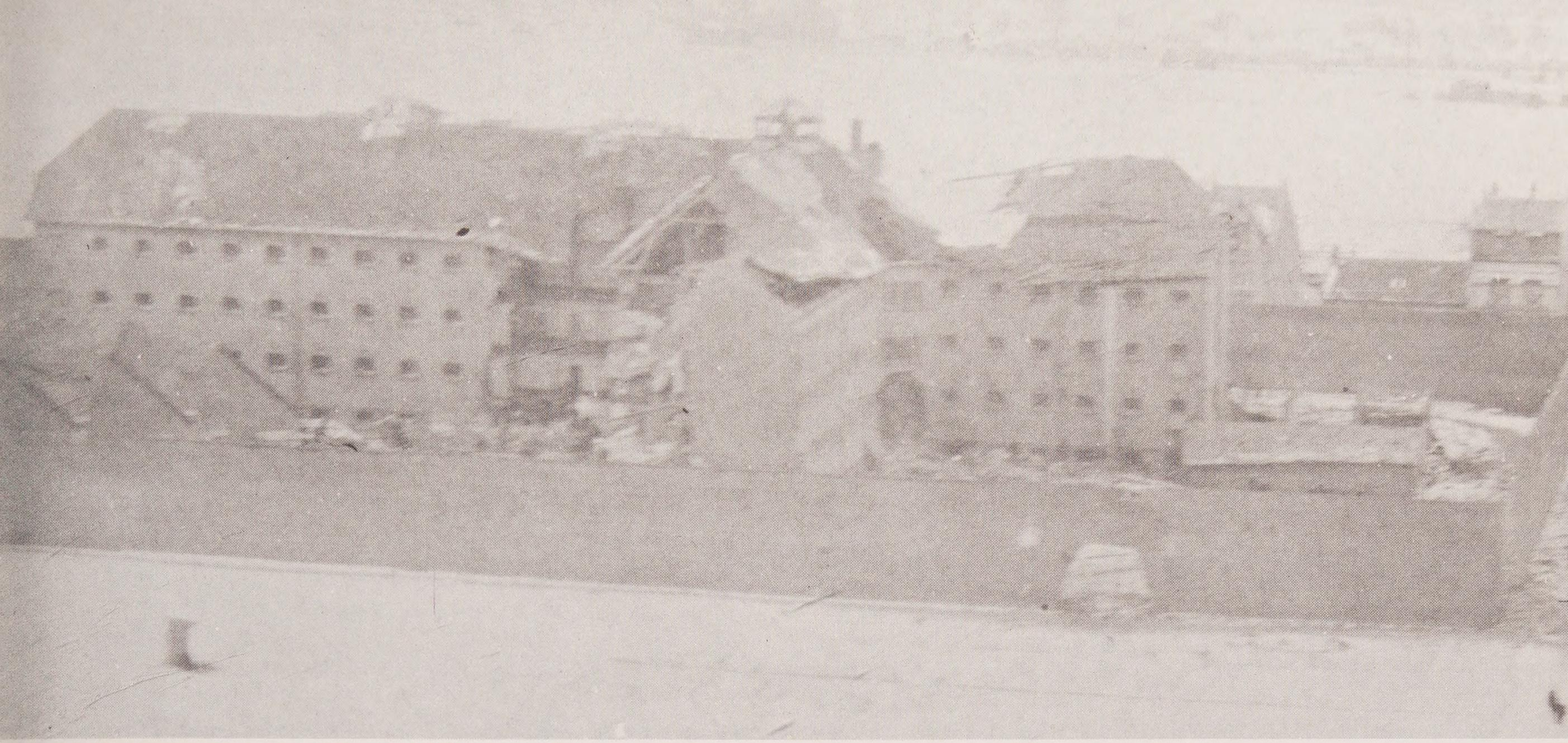
In between paralysing the enemy's communications, there wa still a need for daylight precision bombing attacks, the Mosquito' speciality. Great care was taken not to harm local civilians, and th targets were often marked with white sheets by the Resistanc workers. The Gestapo barracks on a 52 by 30,5m (170 by 100ft) sit at Bonneuil Matours was hit by 9.100kg (9 tons) of bombs on Jul 14. 487 and 21 Squadrons made a low-level attack on the Poitier barracks on August 1, and the next evening 305 and 107 Squadron destroyed a saboteur school in the Chateau Maulny. Basil Embr led 613 squadron on an attack on Egletons school, which was used a an SS barracks, one aircraft being lost over the target. The SS HQ a Vincey, housing about 2,000 personnel, was destroyed by 48 Squadron on August 31, ending this series of operations for the tim being.

Meanwhile, the night offensive continued, maintaining ai superiority and disorganising the enemy retreat across Franc pinpoint surprise attacks lit by flares using the Mosquito's spee and manoeuvrability to full advantage.

Then came the Arnhem disaster. The briefing for 107 and 61 Squadrons commenced at 07.00hr on September 10, 1944, the day the airborne assault, and the targets were troop barracks. Flak wa intense, and two aircraft were lost on this first raid. 21 Squadron als lost one aircraft while bombing Nijmegen. Many other sorties wer flown, particularly at night, but operations were restricted by ba weather.

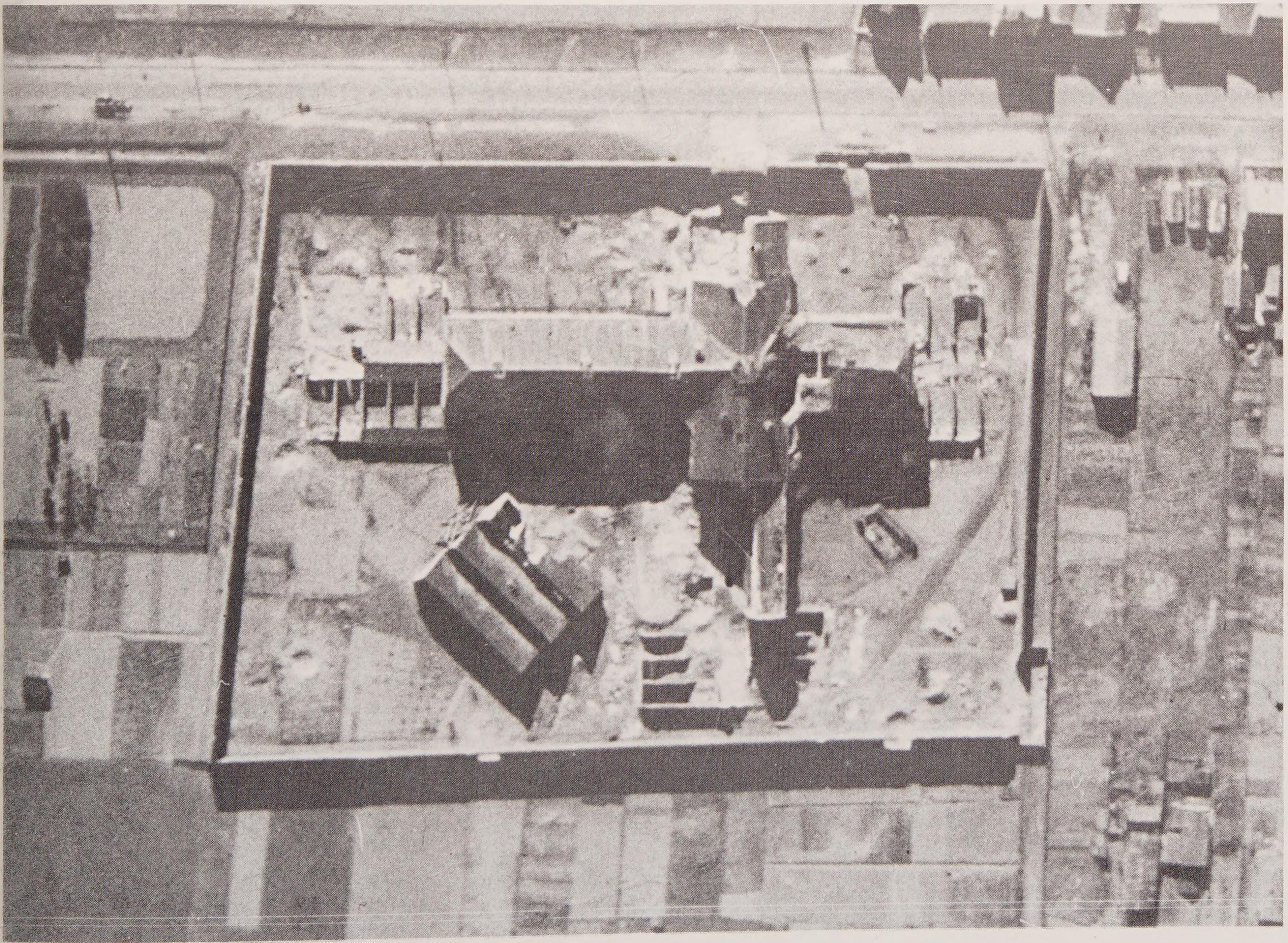
Towards the end of November the Lasham wing moved to th Continent, arriving at Epinoy on 19 and 20 of the month. Despit bad weather, there was little respite for the retreating Germa armies as occupied Europe regained its freedom.

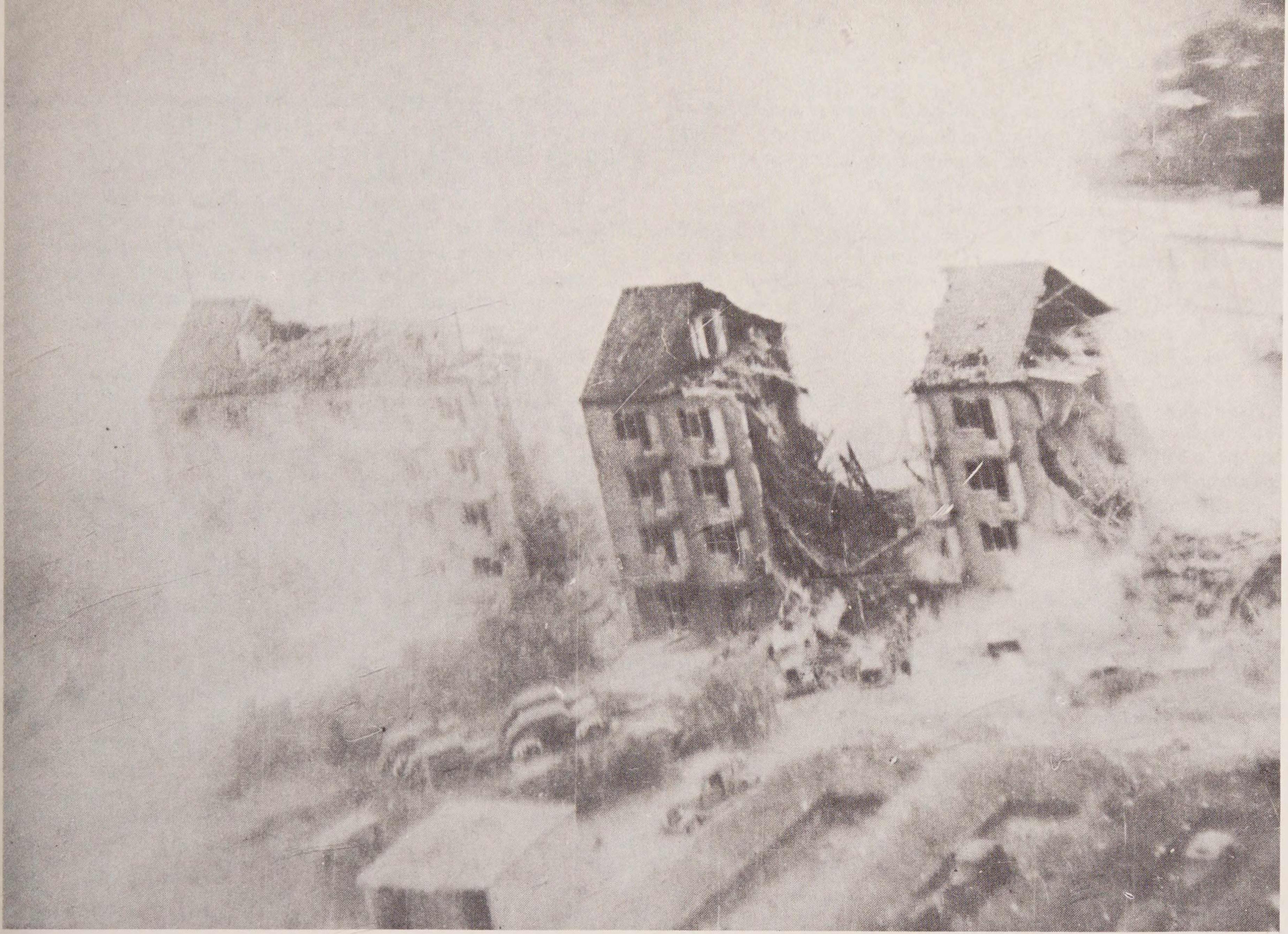
Another important pin-point target was attacked on October 3



The badly damaged Amiens Prison with the breached outer wall, allowing the escape of some of the prisoners. /WM

A plan view of the damaged prison taken after the raid. /WM





**The No. 140 Wing attack on the Gestapo buildings at Aarhus University. In the photo on the left not only are bombs seen leaving a Mosquito, but the bombs from the other aircraft are seen exploding on the right hand building.** */IWM*

when 24 Mosquitoes of 21, 464 and 487 Squadrons, led by Grp Capt Wykeham-Barnes, destroyed the Gestapo Headquarters in Jutland. The aim was to destroy the records housed in two buildings of Aarhus University, which were being used to persecute members of the Resistance. The raid was made at very low level and the weather was bad until the target was reached, but despite damage caused by ground-based obstructions, bomb blast etc, no crews were lost.

All the Mosquito units persistently battered the enemy, 140 Wing having moved to Thorney Island, although a set-back occurred during the Ardennes offensive, a thick blanket of fog preventing support from the air. However, when the fog cleared the Mosquitoes were back in the fray by day and night, the enemy again losing ground until, by the middle of January, the Allied front was moving so rapidly that it was difficult to keep up to date with the position of the German lines. 140 Wing at last moved from Britain to Rosiere-en-Sauterre on February 7, 1945, allowing both wings to penetrate far into Germany, but losses became higher on the risky day attacks and more effort was put into night operations.

Then came another daylight precision attack. The Squadrons of 140 Wing, led by Bob Bateson and Basil Embry, moved back to the UK temporarily on March 20 to operate from Fersfield, in Essex. The target was the Shellhaus building in Copenhagen which housed the Gestapo Headquarters, whose occupants were planning mass arrests amongst the Danish Underground movement. Some prisoners were already held in the building, which was surrounded by other buildings in the middle of Copenhagen but was easily identified as it was the only one camouflaged. The attacking force flew at low level over the North Sea and Jutland, their arrival being so sudden that the covers were never taken off the defending guns. The 11sec delay bombs went right through the front of the building, killing many Gestapo officials, destroying the records, and allowing many of the prisoners on the top floor to escape safely. The aircraft went in so low that one hit a flag pole. Basil Embry pulled up on passing the target, but seeing another Mosquito behind him, dropped down again and flew down one of the crowded streets, hoping that the gap between the building was greater than his wing span.

Regrettably there was tragedy, as one of the early waves of aircraft crashed with its bombs into a convent school close to the target, and in the confusion of smoke and rubble later aircraft aimed their bombs at the wrong target. Others abandoned their attack owing to this same confusion. 87 children were killed in the school, casting a great shadow over the success of the raid, and many others were found by distraught parents, wandering around in a shocked daze. Had all the bombs fallen on the target it would have been completely destroyed with all its occupants, including the hostages from the Resistance.

Mosquitoes continued to attack the retreating Germans, and were able to bomb Berlin for the first time. Then came the final daylight precision raid by six aircraft from 140 Wing, who attacked a Gestapo-occupied school building on the outskirts of Odense on

April 17. 138 Wing ceased operations on the night of April 25-26 as did 21 Squadron. 464 Squadron's finale came on May 2-3, with attacks on trains in the Emden – Bremen area, and on the following night 487 Squadron flew their final operation.

The squadrons then became part of the peacetime British Air Force of Occupation, which was established on July 15, 1945. Then came the gradual wind-down. 21 Squadron was disbanded on November 7, 1947, and 464 Squadron on September 25, 1945, allowing its Australian crews to return home. 487 Squadron no doubt released its New Zealand crews to become 16 Squadron, and then 268 Squadron finally disbanded in March 1946. Of 138 Wing, 107 Squadron was renumbered 11 Squadron in October 1948, continuing to operate Mosquitoes until the end of 1950; No 305 (Polish) Squadron returned to Britain from the continent in October 1946 and disbanded; 613 Squadron was renumbered 69 Squadron on August 8, 1945, equipped with Mosquito B.XVIs in April 1946, and disbanded on November 6 the following year.

The Mosquito FB.VIs of the 2nd TAF had helped paralyse the enemy communications, giving no respite by day or night. They had helped to minimise the threat of the dreaded V–1s, and had assisted the Resistance Movements in maintaining their liberty. It was a few years before the debris of the wrecked trains was cleared from beside the many miles of railway tracks, and any, respite from the hated sound of the "Doodlebugs", as the V–1s were known, was welcome.

## Asia

The other major area of Mosquito Fighter Bomber operations was Asia. Because of the problems of temperature, humidity and rain. Mosquitoes were initially flown out to Asia to test their resistance to the climate and the effects of insects attacking the wooden stucture. In fact, the main reason for changing from casein glue to formaldehyde was to resist the effects of tropical conditions.

In January 1944 No 1672 Conversion Unit was formed at Yellahanka in India to train crews to operate the Mosquito fighter bombers in Asia. The first FB.VIs arrived on March 1 to train the crews of 45 Squadron, who had received their initial aircraft on the previous day. This training was completed after about three months, allowing 82 Squadron to commence training at Kobar on July 4, to be followed by 47 Squadron on October 5. As in Europe, the targets were enemy communications such as roads, railways and bridges, beginning with a strike by 45 Squadron on October 1.

On October 20 there was a major set back when an 82 Squadron Mosquito making a practice bombing attack on the ranges had half the starboard wing collapse during the shallow dive run-in, causing the aircraft to crash. All Mosquitoes in India were grounded pending an investigation, which found serious deterioration in those aircraft which had casein glue in their construction; those with formaldehyde glue were satisfactory. One unit affected was 47 Squadron, which had been told on September 19 that it was going to convert from Beaufighters to Mosquitoes, and had moved to Yellahanka in early October. The aircraft were exchanged on October 5, but on October 25th all Mosquitoes were grounded an on inspection all their aircraft were found to be faulty. By Novembe 30 the Beaufighter had returned.

It was vital that the Mosquitoes be returned to service in th Burma campaign to neutralise the railway network and gi General Slim's 14th Army the advantage it needed. No 45 Squadro was able to resume operations with cleared Mosquitoes o November 9, when eight aircraft attacked Meiktilla airfield. 8 Squadron commenced intruder operations on December 19, flyin "Rhubarbs" against trucks, trains, motor convoys and airfields b day and night.

On February 18, 1945, 47 Squadron reverted to Mosquitoe joining 45 and 82 Squadrons to become part of 908 Wing. The uni commenced Mosquito operations on February 23, but retaine some Beaufighters for bomb and rocket attacks until April 2 leaving the Mosquitoes to bomb and strafe.

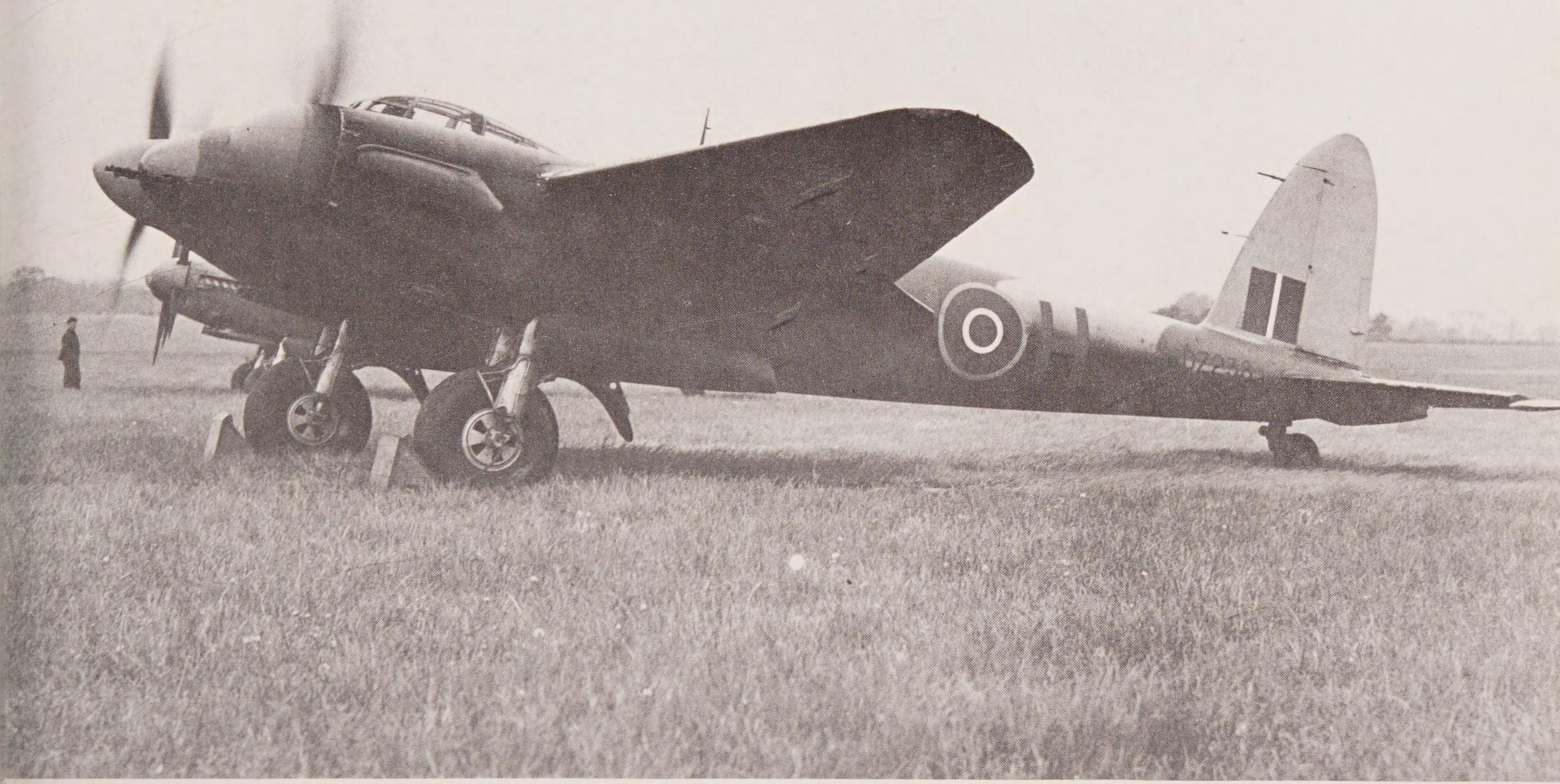
Another squadron which had a false start with the Mosquito wa No 84, which first equipped with the type in the autumn of 1944, bu did not resume conversion until February 1945. Meanwhile, a Yellahanka, 110 Squadron received its first Mosquito FB.VI o January 28. During March the two Squadrons joined forces at Joar and on March 31 commenced operations patrolling roads an waterways.

After the fall of Meiktilla in April 1945, potential targets rapid moved forward, making the sorties longer, until attacks on Rangoo commenced on May 1. Aircraft of 908 Wing operated on a "ca rank" basis, attacking targets identified by the ground forces wh called in the Mosquitoes. The last sorties by 908 Wing were flown May, signalling the finale of Mosquito fighter bomber operations Asia prior to VJ-Day. 110 Squadron continued operations un August, and virtually the last Mosquito strike of the war took pla on August 20.

Some 350 Mosquito FB.VIs were located in the Far East allowing 211 Squadron to re-equip in India in June 1945 for th projected invasion of Malaya, which was avoided by the collapse o Japan. In October the squadron moved to Siam, but an orde grounding the Mosquito for wing spar inspections on January 2 1946, put paid to any action, and the squadron was disbanded a Don Muang, Bangkok, in March.

Despite VJ-Day, peace did not come immediately to South Eas Asia, and it is still an area of armed combat. Problems started wit extremist rebels in the Dutch East Indies proclaiming the independence of Indonesia. Mosquito FB.VIs of 84 and 110 Squadrons wer called in from November 9 to assist in curbing the restive elements On November 15 they were joined briefly by 82 Squadron, whic fired rockets for the first time that day, and 47 Squadron attacke the Soeramarta radio station on November 25. The final strikes wer made during December, although escort and reconnaissance flight continued until January 20, 1946.

The French, however, had a worsening situation in Indo-China so 15 FB.VIs arrived in Saigon from Morocco on January 13, 1947 operated by the French Air Force. The first offensive sorties wer flown ten days later, and by the end of May 345 sorties had bee flown and 76,657kg (169,000lb) of bombs dropped. The Mosquitoe were then flown back to Rabat in Morocco, and continued to b operated in Africa by Groupe de Chasse 1/6 Corse until July 194



**Mosquito Mk.II DZ238 YP-H of No. 23 Squadron used on intruder operations.**

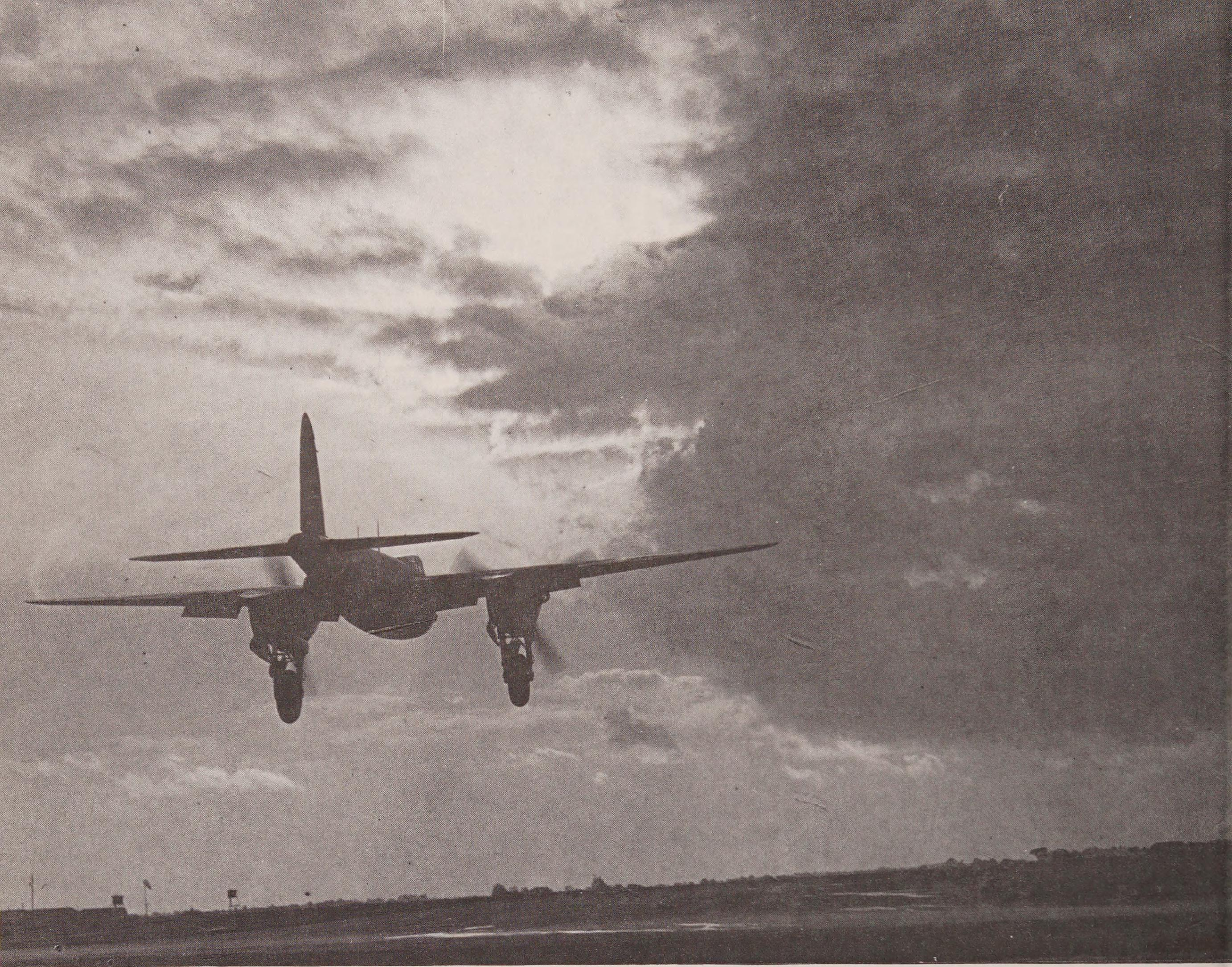
## Intruders

The Mosquito Intruder operations bridged the gap between day fighters and fighter bombers. These operations commenced using F.IIs without radar, and later went on to use the highly effective FBVI. The operations ranged far and wide over Europe by day and night, attacking aircraft in the air and on the ground and many other targets of opportunity. Bombs were not used initially, the punch of the four 20mm cannon being thought sufficient for the job.

In June 1942 23 Squadron at Ford, who had been operating Bostons on intruder missions, received a Mosquito T.III for conversion training, and on July 2 DD670 arrived as the first operational MkII (Special Intruder) Mosquito, making its first sortie four days later. The very next night Sqn Ldr Sam Hoare, later a Wing Commander and 23 Squadron CO, claimed a Dornier Do217, and two nights later another pilot destroyed a Do217 and an HeIII, both as they prepared to land at their bases. The Squadron was moved from Ford to Manston, but because its water logged surface caused accidents a move was then made to Bradwell Bay. The tally of destroyed enemy aircraft continued to grow, with low losses by the RAF, but one of the hazards were lone German decoy aircraft flying around with a tail light on, leading the attackers over heavy concentrations of anti-aircraft guns. As the winter approached, with its bad weather, airborne targets became harder to find and trains or power installations were strafed.

As on other operations increased range became desirable, so long range tanks were installed behind the cameras in the fuselage giving an extra 1½hr endurance. It then appeared that an end had come to intruding from Britain, as the 23 Squadron aircraft were prepared for operations in the Middle East and moved to Malta at the end of the year.

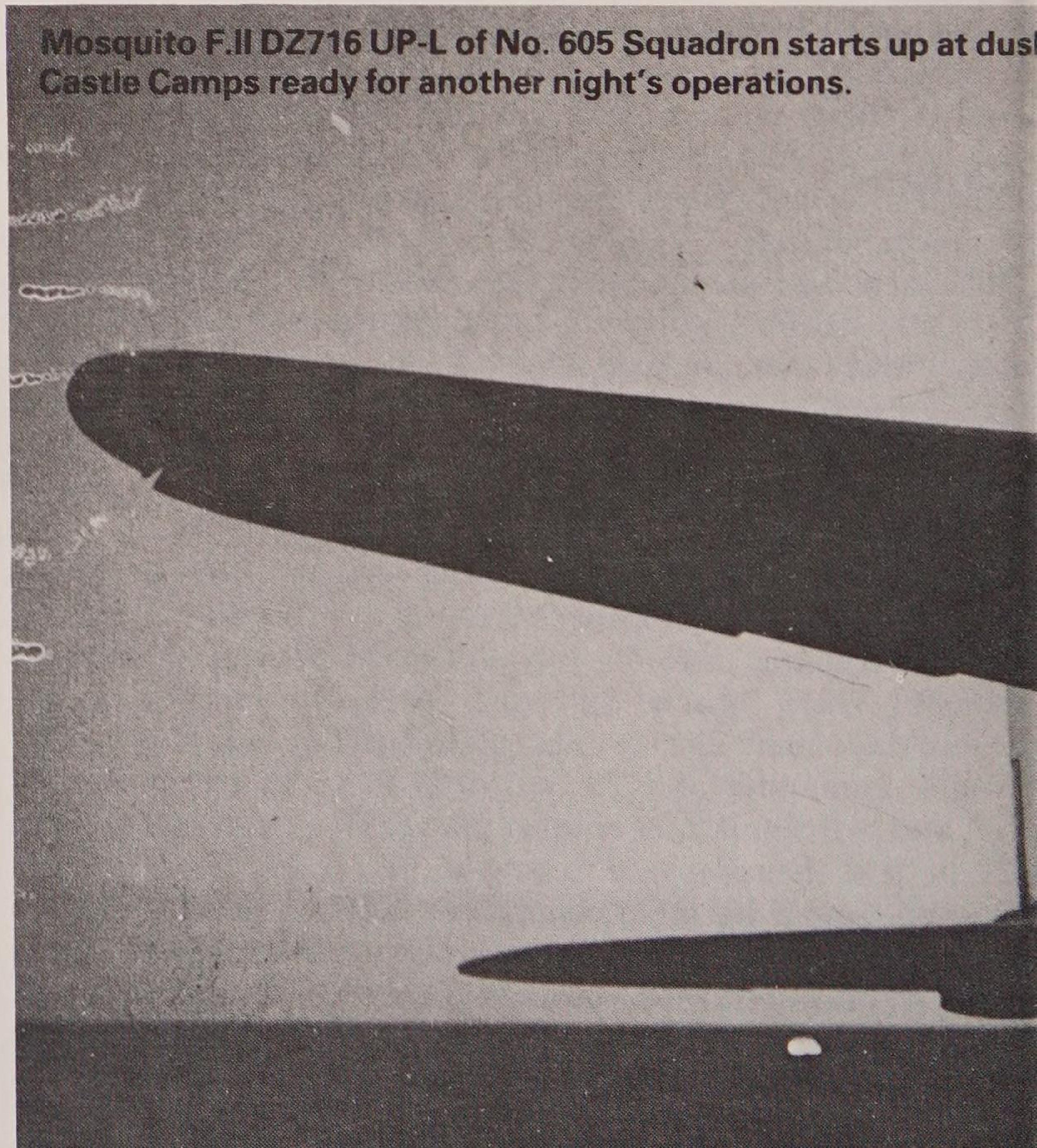
However, the success of 23 Squadron had not gone unnoticed, and six aircraft in each of five night fighter squadrons, Nos 25, 85, 151, 157 and 284, were fitted with long range tanks, equipped with "Gee" navigation equipment and had the heavy radar equipment removed. Ammunition capacity for their 20mm cannon was increased from 175 to 255 rounds per gun. The crews with these squadrons had been trained in night fighting techniques, so further role training was required. In October 1942, a squadron from 51 OTU at Cranfield was transferred to Twinwood Farm under the command of Sam Hoare to provide this specialised training, but with continued growth of intruder operations, 60 OTU was formed at High Ercall from the nucleus of the Twinwood Farm unit in May 1943 to look after all training. A gradual expansion began, up to 50 Mosquitoes being allocated to the unit.



**An Intruder Mosquito landing at Hunsdon under a dramatic sky.**

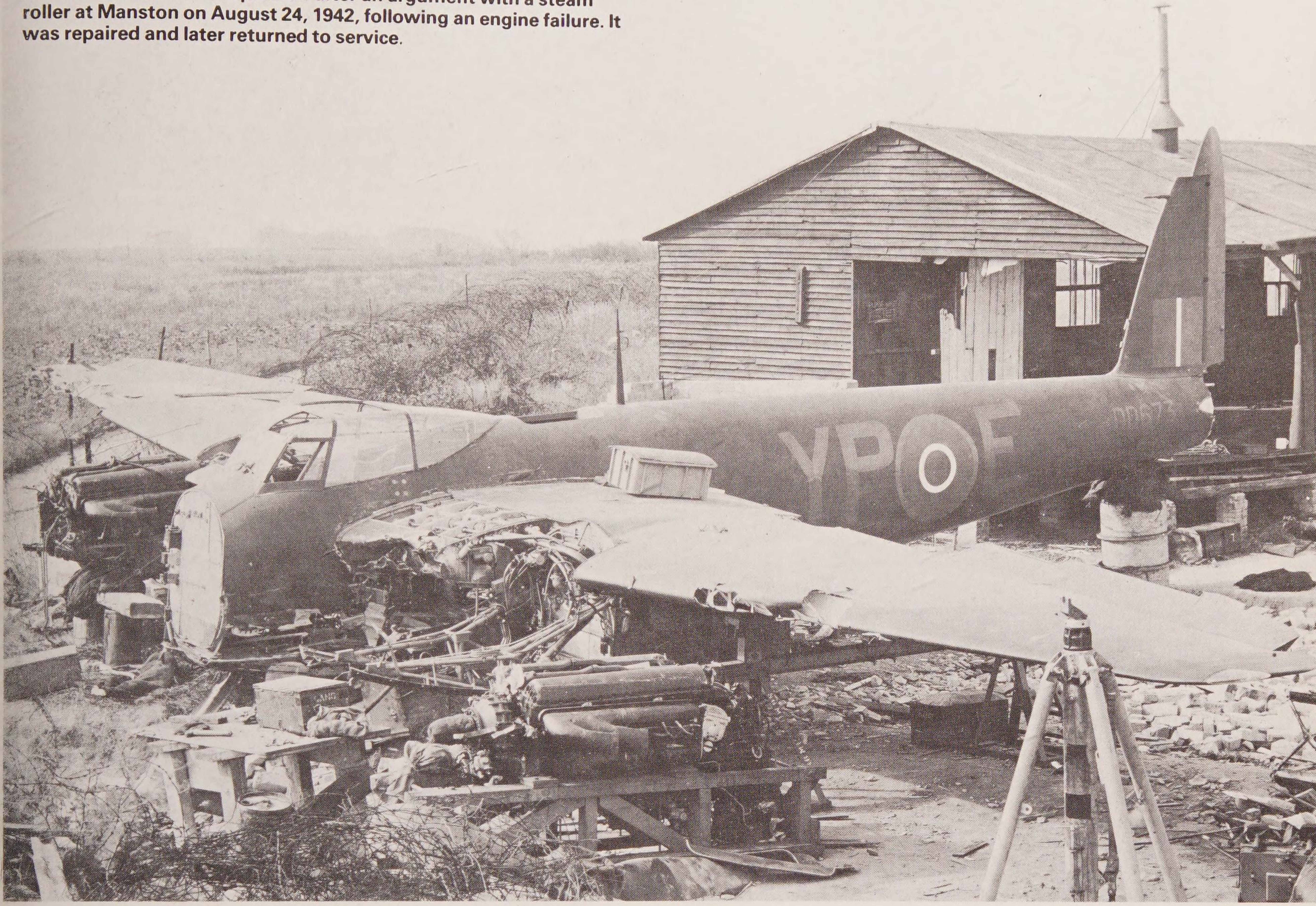
"Rangers", commencing in February 1943, were deep penetrations into enemy territory on a freelance basis, attacking targets of opportunity. Aircraft left at pre-planned times and, once airborne, were out of contact with their base. Their aim was to keep the enemy's fighters deployed at a high readiness state by day and night, to destroy his aircraft in the air and on the ground, disorganise his training schedules and attack communications. Intruders, in contrast, were directed at pre-planned enemy targets and were always in contact with their base. Another method of patrol used initially by Beaufighters, but taken over by Mosquitoes, was "Insteps" to protect the Coastal Command aircraft from attacking fighters over the Bay of Biscay. 264 Squadron commenced "Insteps" with a detachment at Tebalzue in Cornwall from January 6, 1943, and the remainder of the squadron re-opened the Intruder offensive from Bradwell Bay on January 18-19. The same Squadron also opened the "Ranger" offensive, when Wg Cdr Maxwell shot up Lorient Harbour on February 4. The first "Night Rangers" mission was flown by 25 and 151 Squadrons on February 16-17, and two nights later 264 Squadron added shipping to its list of targets.

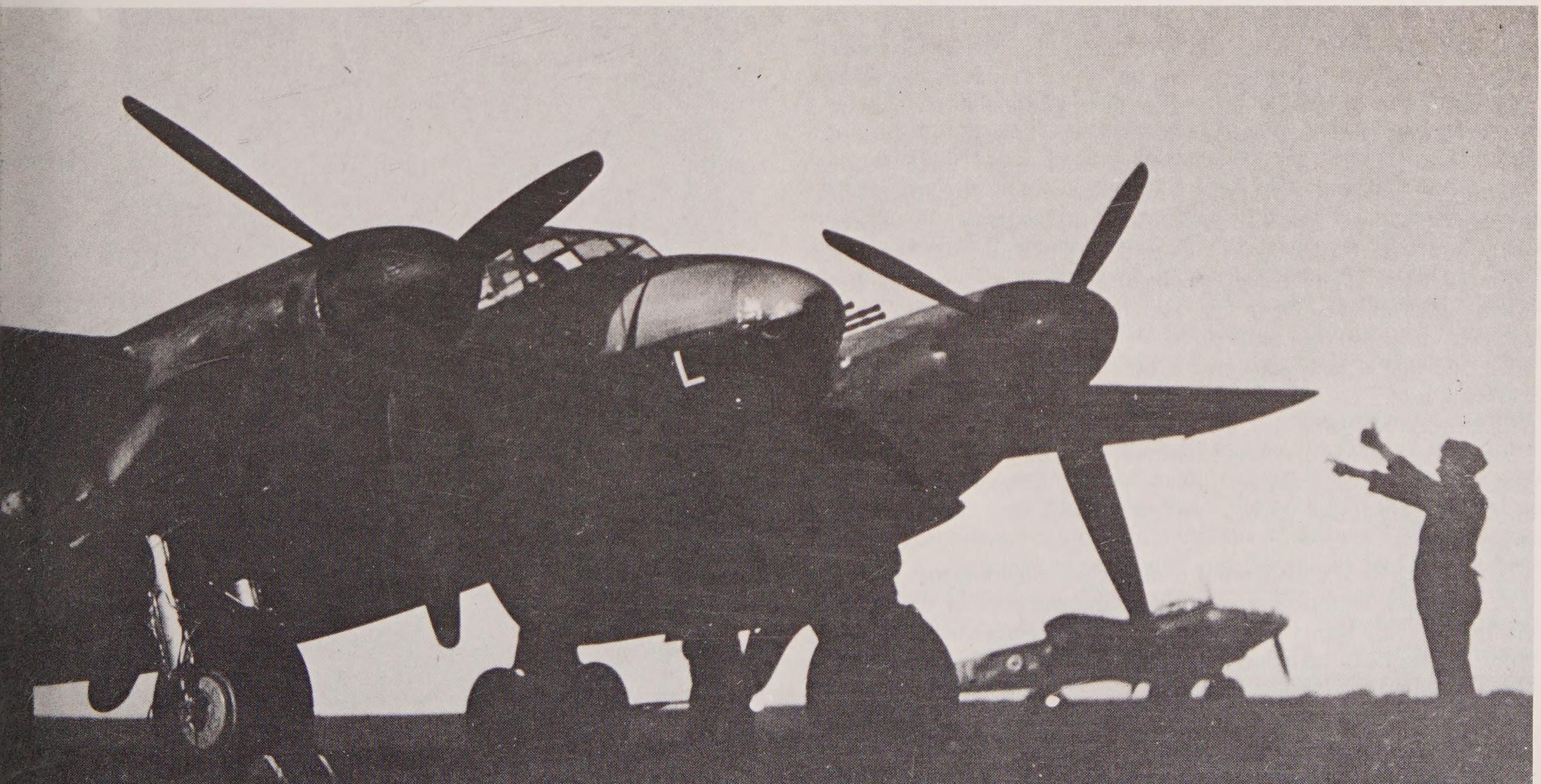
On March 25, 157 and 456 Squadrons commenced Night Rangers, and at the end of the month, 151 and 410 commenced Day Rangers. A major event in March was the equipping of 605

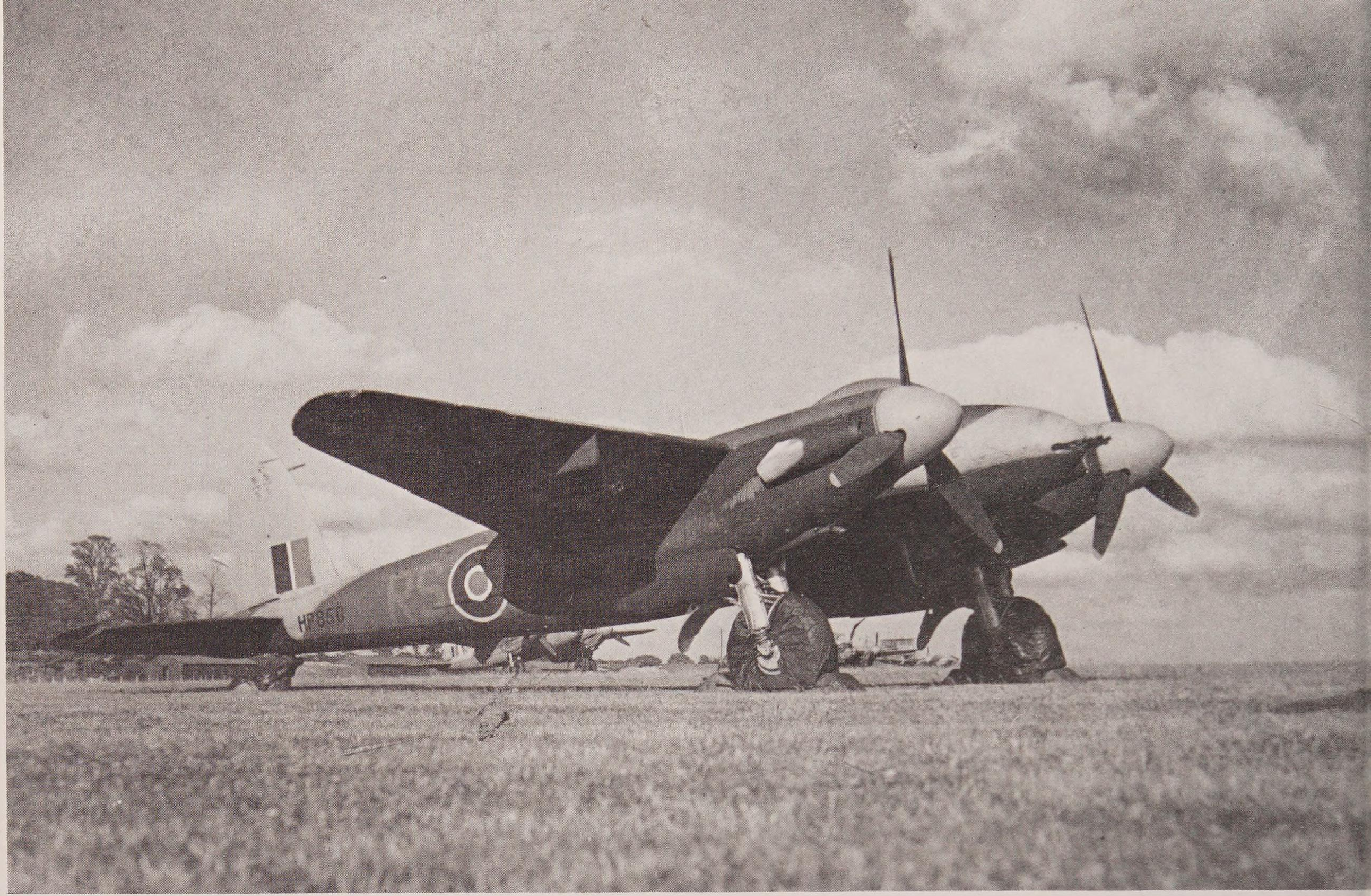


**Mosquito F.II DZ716 UP-L of No. 605 Squadron starts up at dusk**
**Castle Camps ready for another night's operations.**

Mk.II DD673 of No. 23 Squadron after an argument with a steam roller at Manston on August 24, 1942, following an engine failure. It was repaired and later returned to service.







**Mosquito FB.VI HP850 used by the Ranger Flight of No. 157 Squadron based at Hunsdon.**

Squadron with Mosquitoes, committed full time to Intruder operations, to be followed soon after by 418 (City of Edmonton) Squadron, RCAF. Both squadrons soon opened their scoreboards to begin many months of friendly rivalry and outstanding success. While the other fighter squadrons continued on their Ranger and Intruder operations, preparations were in hand for the two Intruder Squadrons to be re-equipped with the Mosquito FB.VI. Not only did this allow the carriage of four 227kg (500lb) bombs, but the provision of wing drop tanks brought much of Europe within range.

In early May 456 and 25 Squadrons began Day Rangers, and on May 14 a 157 Squadron Mosquito destroyed a FW.190 during a Night Ranger over Eureux. The FW.190 was a tough adversary for the Mosquito, as in certain conditions it could have a speed advantage, especially over the Mosquito MkIIs. No 307 (Polish) Squadron began Night Rangers on May 16, shooting up a variety of ground targets during the month, and both 418 and 605 Squadrons initiated their high rate of scoring during June, shooting down enemy aircraft over Denmark, Holland and France. Also in June "Instep" patrols were built up by detachments from 25, 151, 157, 307, 410 and 456 Squadrons. The Mosquito successes brought FW190s into the battle, and these met up with a patrol of four Mosquitoes on June 13. Despite the loss of one FW190, three Mosquitoes were shot down. However, 151 Squadron did manage to destroy one of the feared heavily-armed FW200 Condor four-engined long-range patrol aircraft about 250 miles west of Bordeaux.

In July 1943 MkVIs were introduced to intruder duties by 418, 456 and 605 Squadrons, who, with the support of other units, continued to fly Rangers and bomber support duties until the end of the war. Railway installations and airfield strikes continued to be priority targets.

Although the action is highlighted in accounts of these activiti
crews on night patrols could fly a whole tour of 35 sorties witho
seeing a single target. However, much greater danger was involv
on day intruder operations because of the low-level flying. Aircr
usually operated in pairs, and it was not unusual for at least o
aircraft and crew to fail to return. The majority of the crews h
been trained on Oxfords and Beaufighters, their conversion
Mosquito night fighters usually entailing one hour's dual flyi
followed by an hour solo before joining the Squadron.

The navigator, who had been trained in the use of radar, n
found himself and his pilot flying over Europe at night witho
radar, map-reading by the light of a subdued cycle lamp a
keeping an eye out for enemy aircraft. One such navigator was R
Fidler, and amongst other problems he suffered from air-sickne
Such was his keenness to fly, however that he just added this to
airborne activities. After practising over Britain at night, Reg a
his pilot, Henry Morley, were sent on their first operation, flyi
over Holland on a triangular course to check all the procedur
They were then declared operational. They carried "Gee" to ass
with navigation, but they were usually at such low level that th
were out of range before crossing the Channel on the way o
Nonetheless, it was a great help as a homing aid on the return flig
Despite the Mosquito's success in these operations, the Germa
offered very little in way of retaliation apart from some night figh
sorties mainly directed against our returning bomber formations

No 418 Squadron began to specialise in attacking railw
installations, which was less glamorous than air-to-air combat
equally vital. The continued disruption of the enemy traini
programme was not neglected, and by August airfields in Germa
also became targets. On September 15, 1943, three aircraft a
crews were detached from 418 Squadron to escort the A
Lancasters of 617 Squadron on an attack on the Dortmund E
Canal. For a week they had to practice flying at 273km/hr (170m
at 45.7m (150ft) in formation with the Lancasters, and on the att

they helped suppress the air and ground defences.

The top-scoring Mosquito unit during September was 605 Squadron with claims for ten aircraft destroyed and two damaged. At the end of this successful month, Wg Cdr Hoare became CO of 605, and to celebrate, he shot down a Do217 on his first patrol.

On these risky patrols the Mosquito frequently demonstrated its ability to absorb punishment. When Reg Fidler and Henry Morley were asked if they ever hit chimneys or telegraph poles, they replied that they never flew that high. A 410 Squadron Mosquito attacked a Do217 over Holland on September 26, 1943, giving it a three-second burst from 30m (100ft). The bomber immediately blew up in a blinding flash, showering the Mosquito in burning fuel from nose to tail and scorching off much of the fabric covering. The port engine was shut down owing to loss of oil, and control was lost in a 12,192m (4,000ft) dive due to a temporary loss of vision by the pilot. The dive extinguished the flames and a difficult flight was made back to Coleby Grange, where a safe landing was made in the dark. The aircraft was repaired at Hatfield and relegated to training, as were many repaired aircraft.

Further "Instep" patrols were made by 307 and 450 Squadrons, with a wide range of activity. On September 11, 307 Squadron destroyed a Messerschmitt Bf110 and a Junkers Ju88, damaging a further five Bf110s and four Ju88s. On November 20, 157 Squadron shot down a giant Ju290 and damaged four of eight Ju88s. However, activity became scarcer and "Instep" patrols ceased at the end of April 1944.

On November 28, 418 Squadron commenced the more dangerous Day Rangers operations with an attack on the flying boat base at Lake Biscarosse, which had been attacked before. These Day Rangers depended on reasonable visibility and, for added safety and surprise, low cloud cover. The European winter often provided the cloud cover but not always the visibility, and although the aircraft operated in pairs during the day, they flew singly at night, since the cover of a second aircraft was not needed and collision was a real hazard.

January 27, 1944, was a particularly successful day for 418 Squadron, when the CO, Wg Cdr MacDonald, leading a pair of FB.VIs, shot down two Heinkel He 177s and an FW200 in rapid succession. Another pair from the same Squadron shot down two Ju88s and two Ju34s, also damaging a Ju86. In a mere eight minutes of combat, four Mosquitoes had destroyed seven enemy aircraft, a record which proved unbeatable.

During February both 605 and 418 Squadrons kept busy at night harassing enemy bombers returning to their bases from raids on Britain, their tally gradually climbing. 418 Squadron became so successful with Day Rangers, that they doubled their tally within one month, from 22½ enemy aircraft over 22 months of operations, to an additional 24 enemy aircraft in the next month for the loss of one only Mosquito. In the following six weeks 30 enemy aircraft were shot down and 38 destroyed on the ground by 418 Squadron. 605 Squadron's 100th victory was claimed by Wg Cdr Hoare when he shot down a Ju188 near Chievres on January 10-11. In one day, two 418 Squadron Mosquitoes shot four Minesweeping Junkers Ju52s down into the Kattegat, destroying three more in the air and two on the ground. Then the Squadron broke another record when two Mosquitoes destroyed ten enemy training aircraft. They may not have been so hard to destroy as combat aircraft, but the action helped to prevent enemy pilots reaching combat proficiency.

When Wg Cdr Sam Hoare left 605 Squadron on April 17, his personal tally was 33 aircraft shot down, two probables and 35 damaged on the ground, an excellent score by any standard. By early May, 418 Squadron had 96 enemy aircraft to their credit, the 97th being a Heinkel IIIZ glider tug consisting of two He111s joined together by the wing. Bob Kipp scored a hat trick and made the century when he destroyed three FW190s, making him the top-scoring night fighter pilot on a single sortie without the use of AI radar.

On May 21 418 Squadron was mostly withdrawn from Day Rangers, much of the work being taken over by 605 Squadron, who boosted their score by shooting down their next enemy aircraft during the Normandy landings on June 5 and 6. 418 Squadron was lending their support by flying "Flowers" against various ground targets behind the lines, hitting communications targets in much the same way as the 2nd TAF fighter bomber units. Both 418 and 605 were to assist in the destruction of V–1 sites, intruder work being taken over by 515 Squadron of 100 Group from June 16. This was the unit to which Henry Morley and Reg Fidler belonged. They were based at Little Snoring, where Sam Hoare was the Station Commander and their CO was Wg Cdr F. F. Lambert, a Canadian. They claimed one confirmed night victory, but one of their most memorable incidents was the daytime search for a colleague who had bailed out over the North Sea. The pilot had been picked up rapidly, but no sign could be found of the navigator. Although it was August, the sea was very rough, and the initial search had been completed. Henry and Reg were then given a search area which drew a blank and on a hunch, allowing for the high winds, they went off at a tangent and were elated when they located the missing navigator, having succeeded where Sunderlands, Walruses and

**The Squadron commander climbs aboard his aircraft for another night intruder operation.**

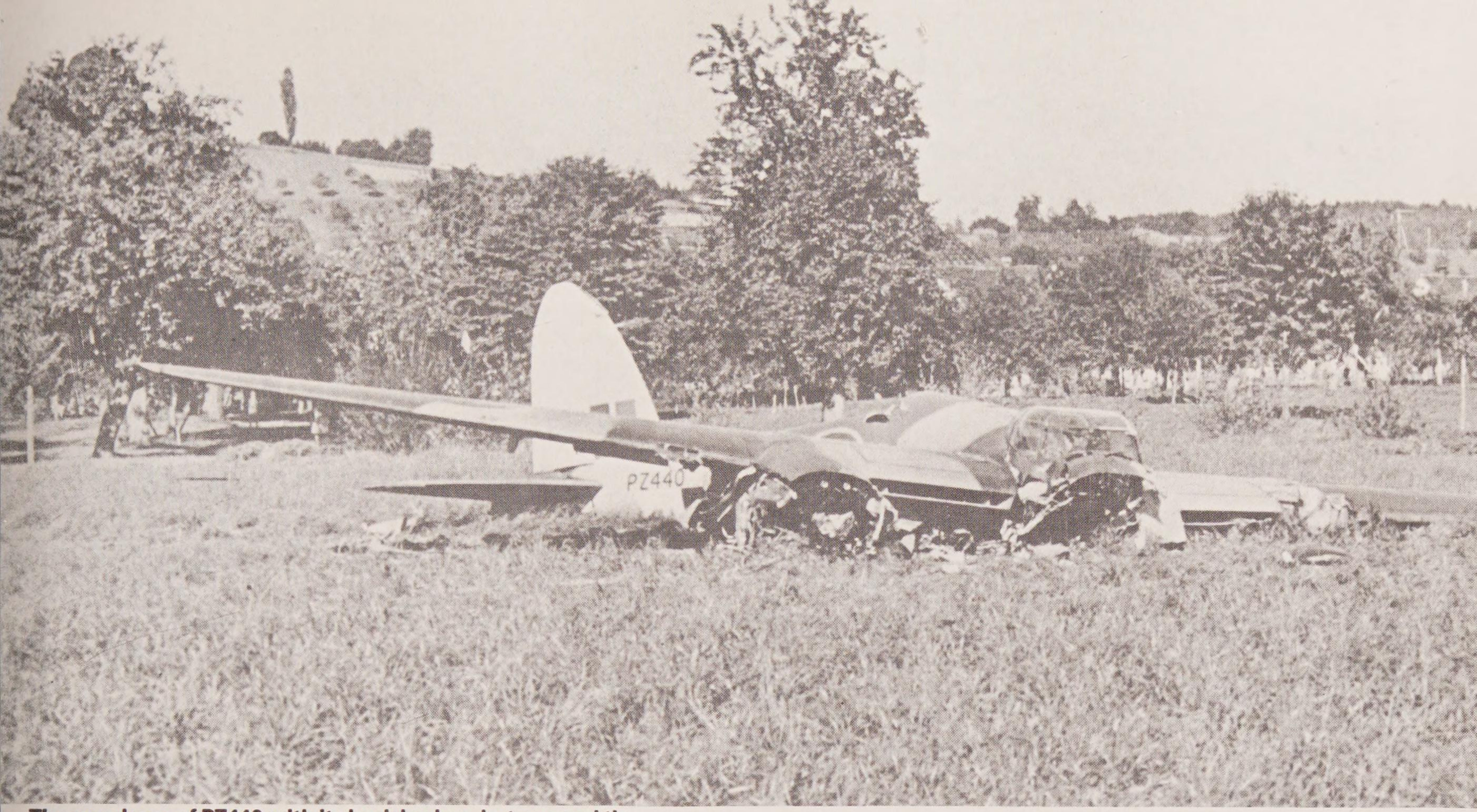
**RAF Hunsdon in 1943 with Mosquitoes dispersed.**

boats had failed. Having located the survivor, a Walrus landed alongside to pick him up, but by this time he had drifted close to the Dutch coast and the sea was rough. After four attempts, the Walrus managed to stagger into the air, with the Mosquitoes circling above like mother hens. Even the coastal guns stayed silent while the rescue was under way.

During July and August 515 Squadron flew Rangers, claiming a number of enemy aircraft, and they were joined by aircraft from 29 and 406 Squadrons. Shipping was also an occasional target, but not too popular with the crews because it was often well defended. With the opening of the Continental bases it was possible to reach into East Germany and Czechoslovakia.

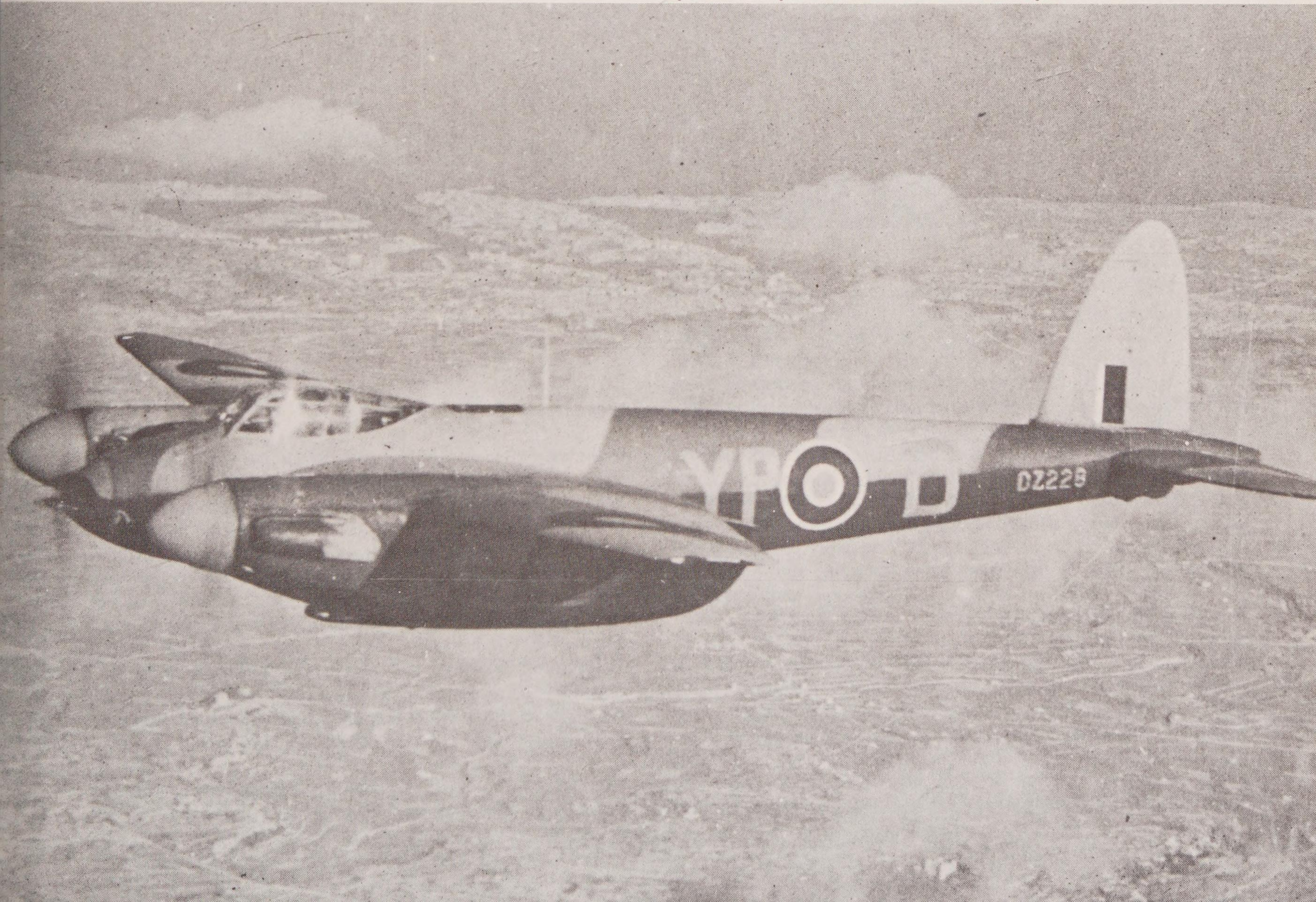
In September 1944, the V–2 rockets started hitting Britain. They were impossible to intercept in flight, so 418 and 605 Squadron were tasked with the location and destruction of the launch sites, to catch the missiles on the ground. Then, on a Day Ranger, 418 Squadron achieved what was probably an unbeatable record score when two Mosquitoes destroyed seven Ju88s, a Bf110, a Ju87 and a Bf109, as well as damaging many other aircraft. Despite the high risks, the eventual loss rate was only 2.8 per cent, usually due to flak but sometimes to flying accidents. In one week 605 Squadron destroyed 16 aircraft, claimed one probable and damaged 11.

Intruder operations by 515 Squadron continued, and o September 20 PZ440 and NS993 were given Holzkirchen airfield 32km (20 miles) south-east of Munich, as their target. Henr Morley and Reg Fidler were the crew of PZ440, and while pressin home their low attacks their aircraft was damaged by the explosio of their target as they flew over. The fuel tanks were punctured an one engine stopped, and the other aircraft was also damaged, bu less seriously. Both set course for neutral Switzerland, but thei reception was not friendly, as PZ440 was fired on by Swiss ack-ac and attacked by defensive fighters, which disabled its remainin engine. They had no alternative but to force-land, and came i silently over a farm cart, whose owner didn't even look up. Luckil they were not over the mountains, and they skidded to a undignified halt in a convenient level field. The aircraft shattere around the crew, throwing out Reg Fidler and injuring him. Henr Morley, the pilot, was still strapped in the broken cockpit. In a daz he put out the smouldering wiring around the instrument panel wit hig gloved hand, unstrapped himself, wriggled out, dragged h navigator clear and gave him a morphine injection. Reg Fidler mad a remarkable recovery within half an hour, but was less happy as th morphine wore off. While the inexpert injection was being administered, a Swiss photographer had arrived on the scene to photograp the crashed aircraft, which, like many Mosquitoes, did not bur The aeroplane was a write-off and the crew were interned. Th eventually returned to Britain, but did not fly on operations agai The other Mosquito had also lost an engine and made a successf



The wreckage of PZ440 with its back broken, but as usual the cockpit intact, the saving of many a crew.

No. 23 Squadron and its Mk.IIs moved to Malta in December 1942 to fly intruder operations over southern Europe.



**The ground crews preparing a No. 23 Squadron Mosquito for its next operation. The machine guns are being loaded and the barrel of one of the four 20-mm cannons is being cleaned.** *IWM*

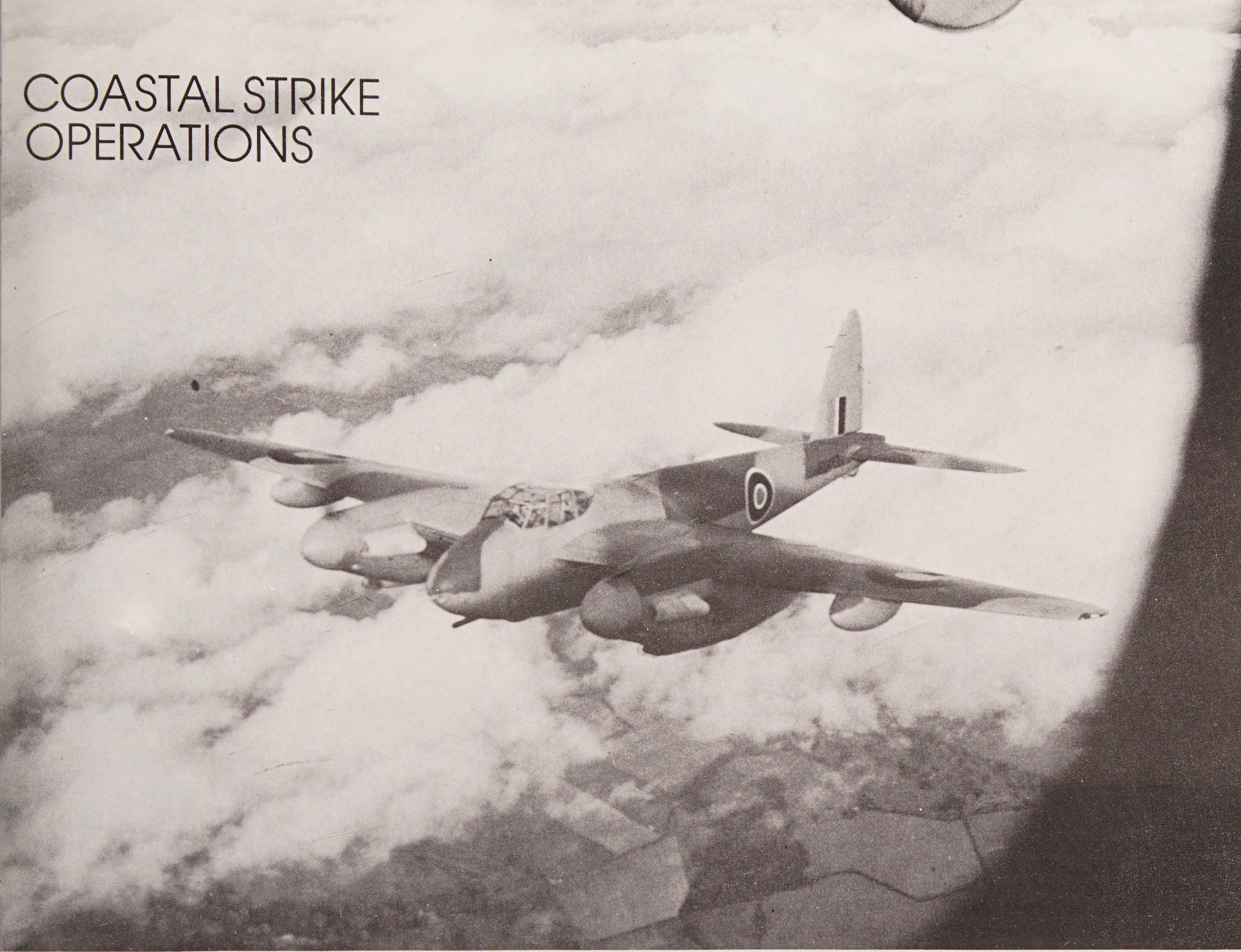
forced landing, and joined the increasing stock of Allied aircraf collected in Switzerland.

In mid-November 418 and 605 Squadron joined the 2nd TAF and continued to operate with the other FB.VI units until the end of the war in Europe. Without the aid of radar, the two squadrons had sho down well over 200 enemy aircraft, in addition to the destruction o many other targets on the ground. The combined total of Mosquito losses was 91 aircraft failing to return, but many of the crew members survived. 418 Squadron disbanded at Volkel on September 7, 1945, its crews returning home to Canada; 605 Squadron was re-numbered 4 Squadron at Volkel on August 31 1945. In July 1950 the unit converted to the fighter/ground attack role, re-equipping with Vampire FB.5s at Wunstorf. One of the ex-605/4 Squadron Mosquitoes FB.VIs, TA122, is now preserved at the Mosquito Aircraft Museum at Salisbury Hall. Although it only consists of a fuselage at present, it is planned to restore it completely in due course.

No. 515 Squadron received the first AI.XV (ASH) radar equipped Mosquitoes in November 1944, and chalked up its first victory, a Ju88, on the last day of the year. During the spring of 1945 it continued to intrude against enemy airfields, making its last attack on May 2 and disbanding at Little Snoring on June 10, 1945 Most of the crews then went to 627 Squadron.

The Squadron which started intruder operations, No 23, had been posted in December 1942 to the sunnier but no less dangerous island of Malta. They commenced operations from Luqa, intruding over Sicilian and Italian airfields as well as damaging the communications systems. Mosquito FB.VIs began to replace their older MkIIs on May 17, 1943, when HJ672 arrived, the first sortie with this type being made against Rome on July 17. By the middle of 1943 many of the major targets were out of range of the Mosquitoes despite moves to the Italian mainland, so in mid-1944 the Squadron returned to Little Snoring to join 515 Squadron, its duties changing to bomber support within Bomber Command.

# COASTAL STRIKE OPERATIONS



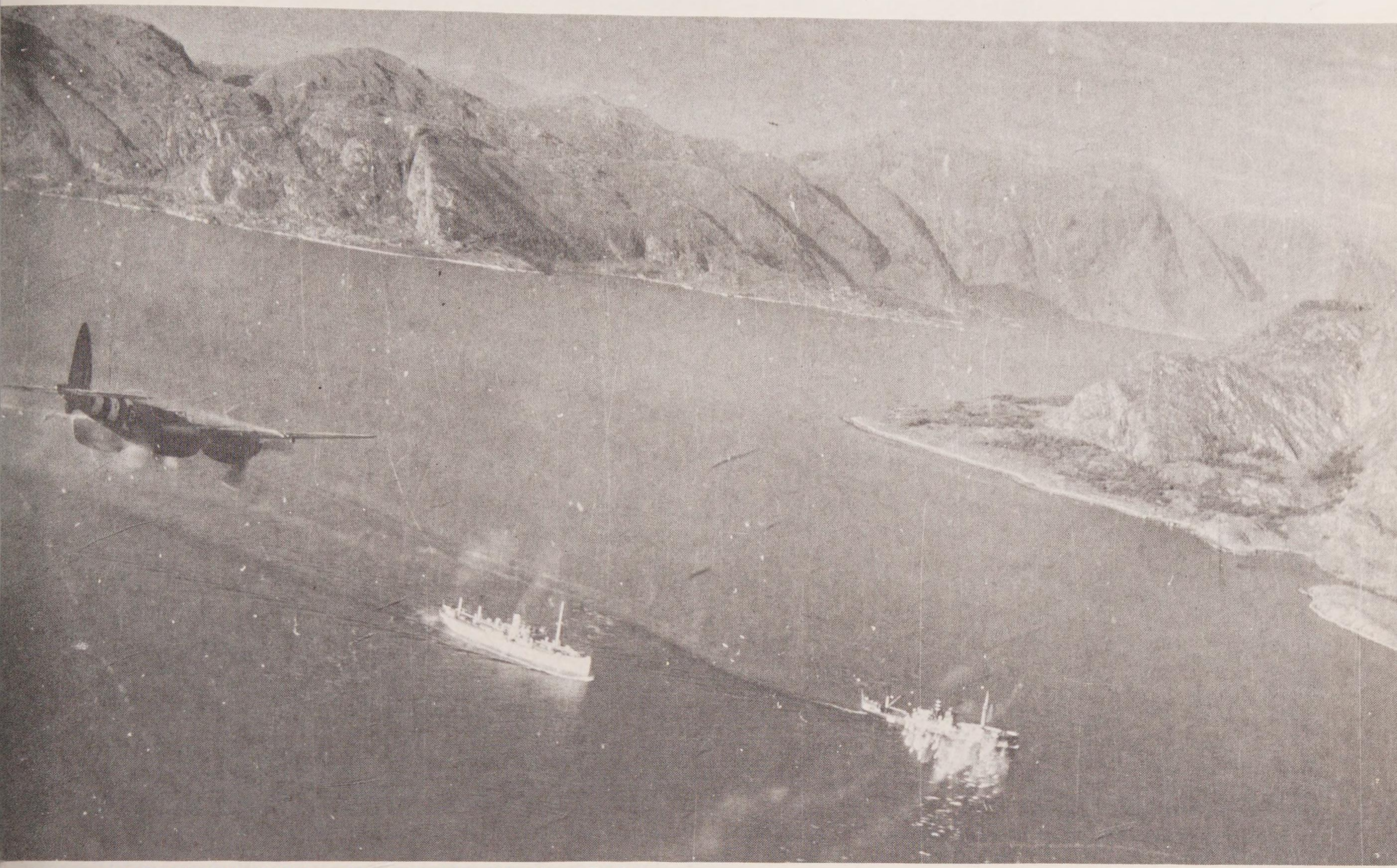
**Mosquito FB.XVIII PZ,467 with a 6 pounder 57-mm cannon replacing the normal four 20-mm cannons.**

In addition to the Mosquito FB.VIs used on coastal strike, there was the specially-developed FB.XVIII with a single heavy-calibre weapon replacing the normal four 20mm under-floor cannon. The six-pounder gun was installed over a very short period, using damaged Mosquito fuselages for trial installations, and the trial firings were surprisingly smooth despite the recoil action and blast effect. On May 10, 1943, 30 sets of gun parts were ordered to be fitted into a batch of the FB.VIs in production. The weapon being the standard 6lb 57mm anti-tank gun, but initially only three aircraft could be spared for conversion. The prototype installation was made on HJ732, and production aircraft had a 295lit (65gal) fuel tank fitted in the fuselage, allowing sufficient endurance for patrols over the Bay of Biscay to locate surfaced U-boats and other shipping.

No squadron was fully-equipped with the MkXVIII, the arrangement being that this big gun version would fly on anti-shipping patrols with FB.VIs to offer the widest possible capability of dealing with any targets which appeared. Two FB.XVIIIs were therefore allocated to 248 Squadron, based at Predannack in Cornwall, from October 22, 1943. Because this unit normally operated Beaufighters, a detachment of air and ground crew were allocated from 618 Squadron, who were having one of their periods of inactivity from their "Highball" training. This gave the crews a chance to fly on operations, commencing on October 24, but tragedy struck during their second sortie on November 4, when the CO of 618 Squadron, Sqdn Ldr C. F. Rose, was hit by guns on a trawler and hit the sea. On November 7 the first U-boat was spotted, and was obviously damaged because it crash-dived. These attacks forced the Germans into providing sea and air escorts for their returning submarines, but this did not stop the Mosquito attacks; it just made them more difficult.

In mid-December 248 Squadron began to convert to Mosquitoes using a T.III and two MkIIs, while the Beaufighters and Mosquito MkXVIIIs continued to chase enemy shipping. The unit's primary role with the new FB.VIs was to be fighter reconnaissance, with fighter support for strike squadrons as a secondary task. The pilots would be flying regular interceptor patrols, escorting anti-shipping and U-boat operations in the Bay of Biscay. The unit commenced these operations on February 20, 1944, and their first major action came on March 10, when four FB.VIs escorting two XVIIIs located

The four .303-in machine guns and one 57-mm cannon under the cockpit floor.



**A Mosquito FB.VI of No. 235 Squadron attacking shipping off the Norwegian coast on September 19, 1944.**

a German naval force, escorted by Ju88s. The MkXVIIIs concentrated on the shipping, damaging a destroyer and attacking a U-boat, as well as managing to shoot down a Ju88 – no doubt with machine guns. The escorting aircraft destroyed at least two Ju88s and claimed one probable.

An attempt to increase the 248 Squadron Special Detachment to six MkXVIIIs was turned down, as rocket-armed Mosquitoes were entering service and did a very similar job without the complication of the big gun. However, the MkXVIIIs continued with the unit until January 1945. The heavy defences of the shipping attacked made the job of these crews very hazardous, and a number of aircraft were lost.

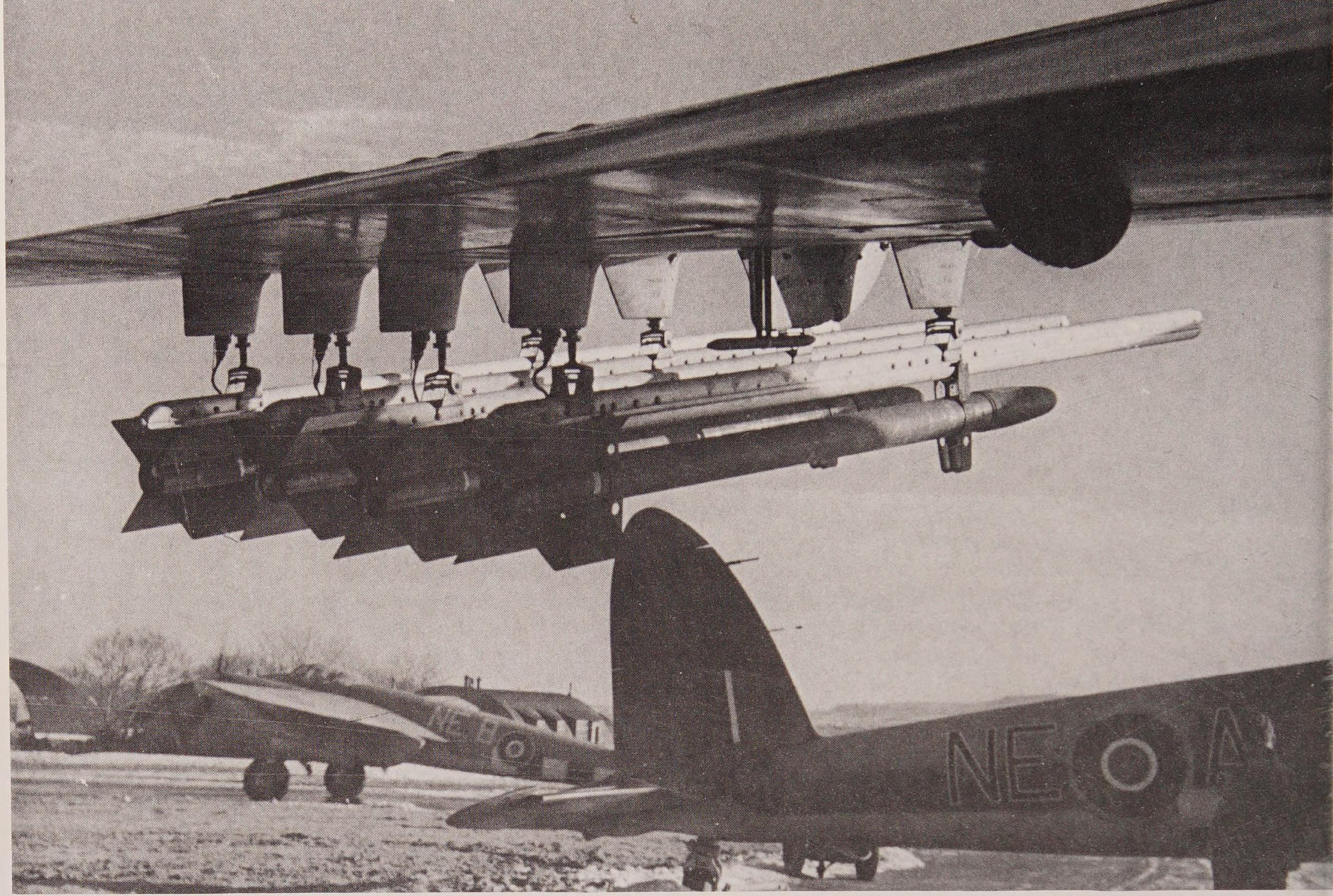
On D-Day 248 Squadron was allocated the considerable tasks of preventing enemy surface ships and U-boats attacking allied shipping, blocking the channel and Biscay ports and providing cover for air strike forces. An example of the latter was the escorting of Beaufighters of 144 and 404 Squadrons on a roving mission in Biscay. Despite many inconclusive attacks on U-boats, the MkXVIIIs of 248 Squadron were able to claim a half share with a Liberator on June 10, when U–821 was sunk.

The installation of wing-mounted mines and depth charges was tested at Boscombe Down in 1944, but only the latter were adopted. The first operational use of 11kg (25lb) depth charges occurring on June 22, 1944, when they were dropped by 248 Squadron. From time to time 500lb bombs were also dropped, but this was rare and they were only used against surface shipping.

In June 1944 248 Squadron were joined by 235 Squadron at Portreath, the new arrivals making their first operational sortie on June 16. Their Beaufighter operations ceased on June 22, and from then on they worked regularly together, often in support of the Beaufighters of 144 and 404 Squadrons with the usual mixture of the two Mosquito versions, firing shells and dropping bombs. In July and August both squadrons had aircraft as their targets, the most common being Do217s carrying glider bombs, of which they claimed two each. With the retreat of the German armies on the Continent, shipping targets became scarce in the Bay of Biscay, the last sorties being made on September 7 in search of U-boats.

A move was then made to Banff in Scotland, where the two Squadrons joined 333 (Norwegian) PR Squadron to form the Banff Strike Wing. The target areas were to be on the Norwegian coastline, guided by the Norwegian pilots to pinpoint targets, or the Kattegat, and as before the Mosquitoes were to escort Beaufighters. Targets were often identified in advance by the PR Mosquitoes and were usually ships at anchor. The strike aircraft would be called in to deal with the target and eliminate it before it went to sea again and became more difficult to hit and well defended. It appeared to our pilots that the Germans always put a large number of guns on their shipping, so during an attack it was necessary to keep the enemy's heads down by firing the aircraft's guns.

The first combined strike from the new base was made on September 14, 1944, when 25 Mosquito FB.VIs of 235 and 248 Squadrons, four MkXVIIIs of 248 and 19 Beaufighters from 144 and 404 Squadrons flew on an armed reconnaissance of the Norwegian coast. Four motor vessels and their two escorts were attacked and left burning.



**Rocket Projectiles fitted on underwing racks to a Mosquito FB.VI.**
*Charles E. Brown*

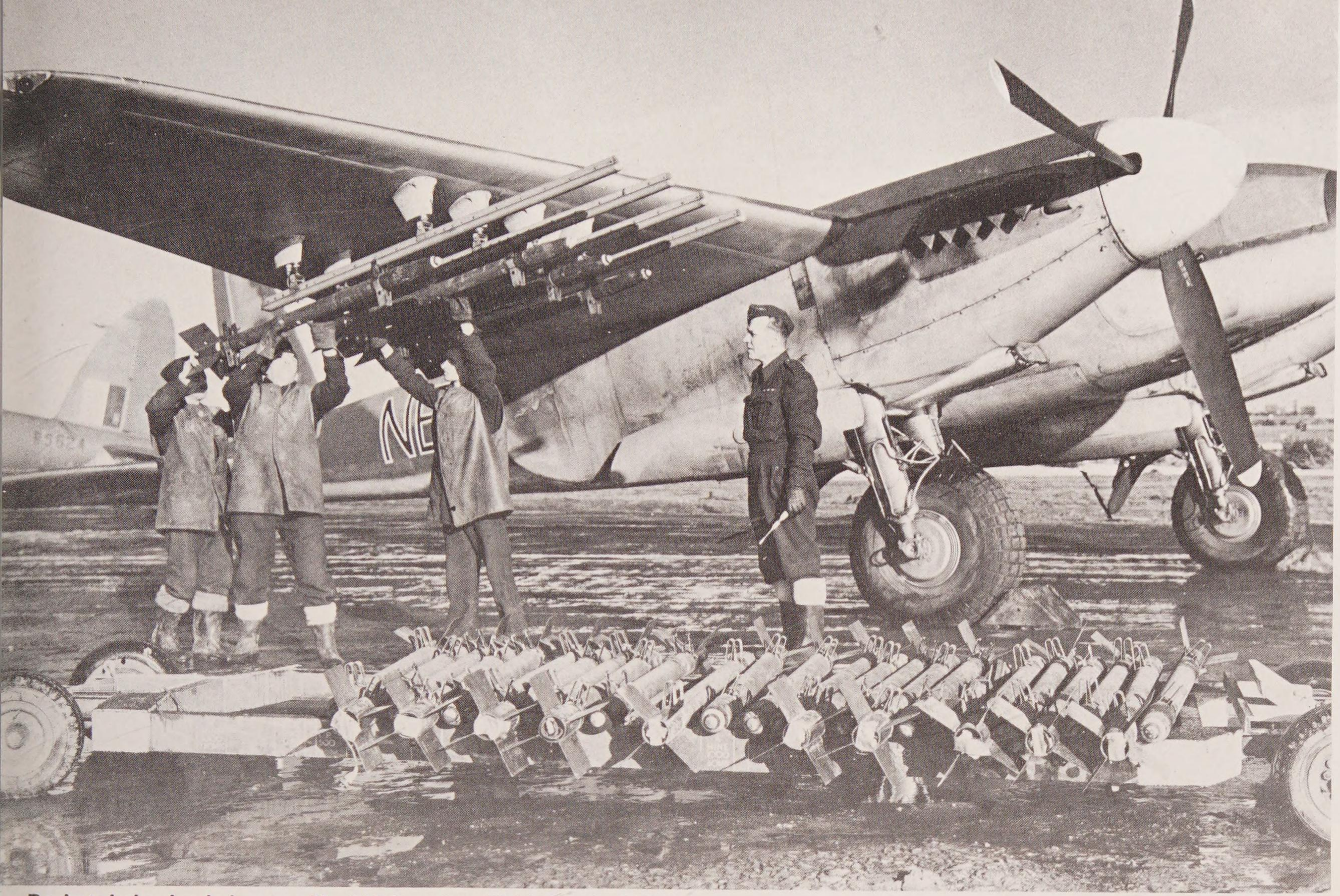
On October 26, rocket projectiles (RPs) were fired for the first time, and proved cheaper and more effective than an air-launched torpedo. Studies for fitting RPs under Mosquito wings began in the autumn of 1943, and on September 28 the installation of four racks beneath each wing, each rack carrying one 27kg (60lb) RP, was approved. The ideal dive angle of 20° was established on test, and when the projectiles were fired there was no recoil or stress in the airframe. Two types were produced, the 11kg (25lb) solid armour-piercing type and the 60lb semi AP high explosive head. Although the latter had a similar effect to a broadside from a cruiser, when they exploded they threw up a great deal of debris in the path of the launch aircraft and were therefore seldom used. The RPs gave the Mosquitoes a good hitting power in a highly effective and mobile form.

With the build-up of Mosquito FB.VI production, 143 Squadron was formed at Banff to replace some of the Beaufighters. It had been operating Beaufighters at North Coates, but had never participated in action as it had served as a mobile OTU, working up new crews or aircraft before they were posted elsewhere. The unit's move to become part of the Banff Wing was therefore greeted with enthusiasm, especially as it was to convert to Mosquitoes, although the aircraft provided for conversion training were not exactly the best on the base. Sqn Ldr David Pritchard joined the unit at Banff as "A" Flight Commander, their task being mainly RP firing. The gunsight was depressed by 5° or 6° and aimed at the waterline of the ship below the funnel. The cannon were fired in a 20° dive, and when they struck the bridge the range was 548m (600 yards), and therefore the correct distance to fire the RPs. Although the RPs could be fired in pairs, they were normally fired in a salvo of eight, harmonised for two dry hits on the super-structure, two on the water line, and four to fall short. These four flattened out in the water and punched through the hull into the engine room. Not only would the ship then start filling with water, but the rocket motors would wreck the boilers and set fire to the fuel and oil pouring out of the fractured pipes in the engine room. As the aircraft flew over nothing appeared to have happened, but on looking back when they had reformed the ships would be either burning or inverted, soon to disappear below the waves.

No 143 Squadron commenced their operations on November 7, not carrying bombs but contributing to a combined offensive load of cannon, machine guns, rockets, bombs and the six-pounder guns with the other squadrons. On November 21, 1944, the largest strike up to that time was made against shipping in Aalesund. A total of 32 Mosquito fighter bombers, with a 333 Squadron PR aircraft, plus 42 Beaufighters and top cover by 12 Mustangs drove home the attack.

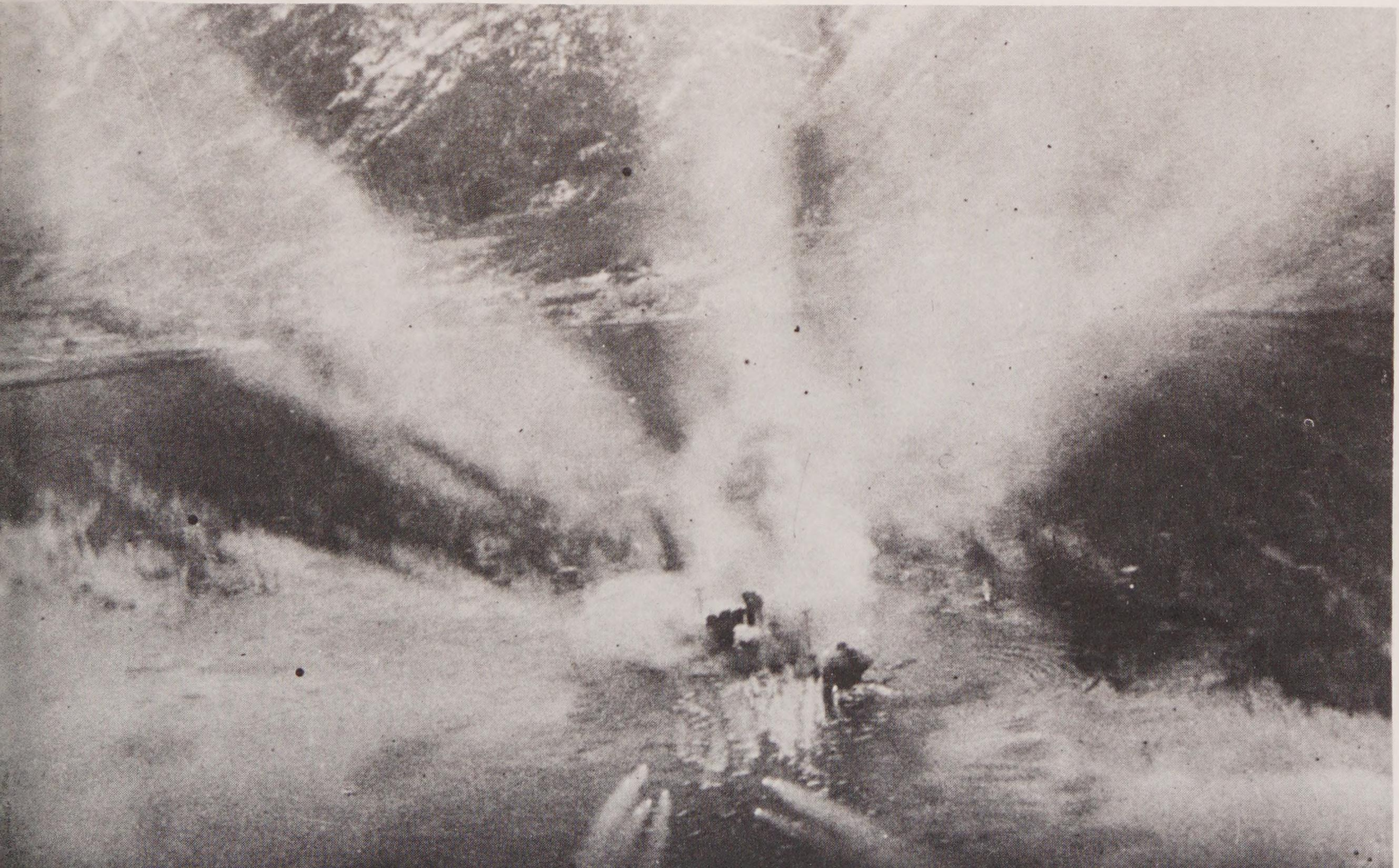
On December 7 the strike Mosquitoes came face to face with a total of about 25 FW190 and Bf109 enemy fighters. In the ensuing battle, the escorting Mustangs claimed four Bf109s, and two FW190s collided, but two Mosquitoes, a Beaufighter and a Mustang were lost. On another attack, on well-defended shipping in Leirvik harbour on January 15, 1945, nine very experienced FW190 fighter pilots helped to destroy some of the six Mosquitoes lost on the raid. One of these losses was David Pritchard's normal aircraf which was being flown by another crew. It was replaced by RS.625 coded NE-D.

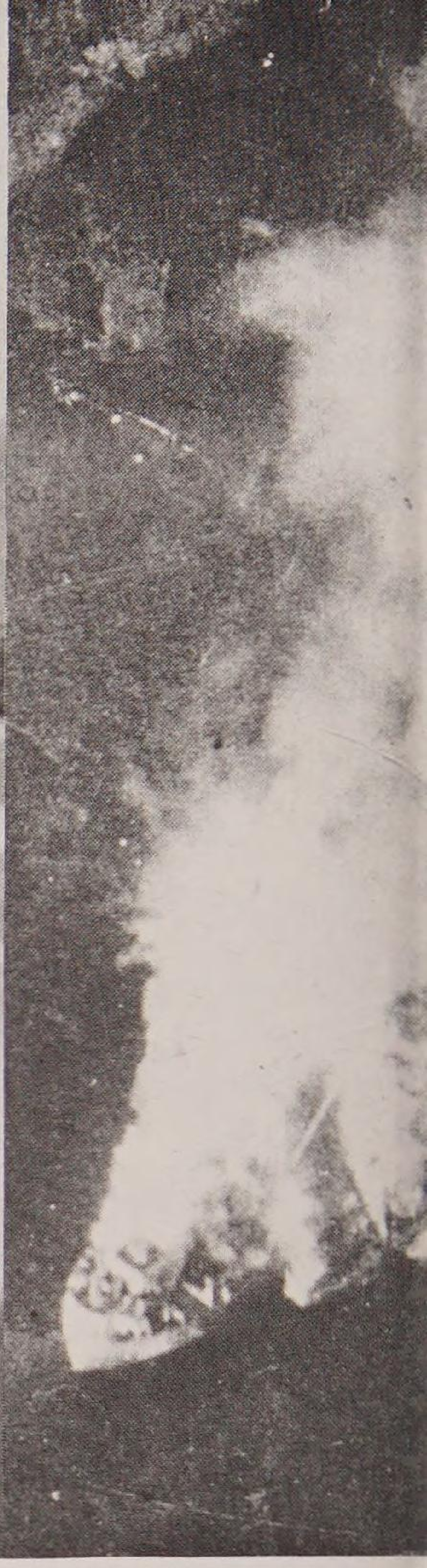
On January 15 the MkXVIIIs were withdrawn from 248 Squadron's Special Detachment, to be used later by 254 Squadron as the RP was so effectively replacing the heavy cannon in spite o the fact that it was heavy and the installation caused a lot of drag loaded or unloaded. It was then decided to hang fuel drop tank



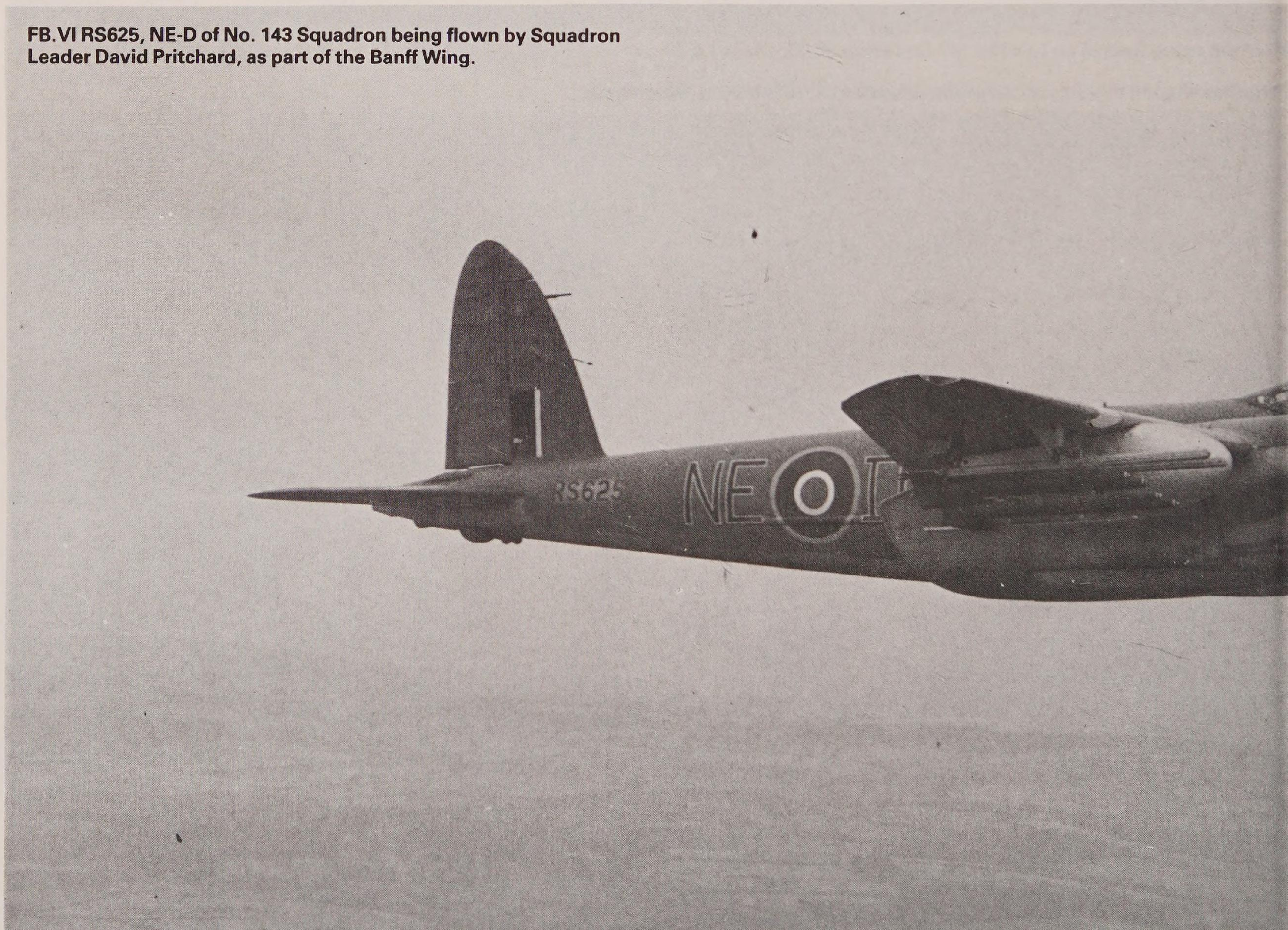
**Rockets being loaded on to a No. 143 Squadron FB.VI.** *Charles E. Brown*

**Another ship off Norway receives the attention of rocket-firing Mosquitoes.**

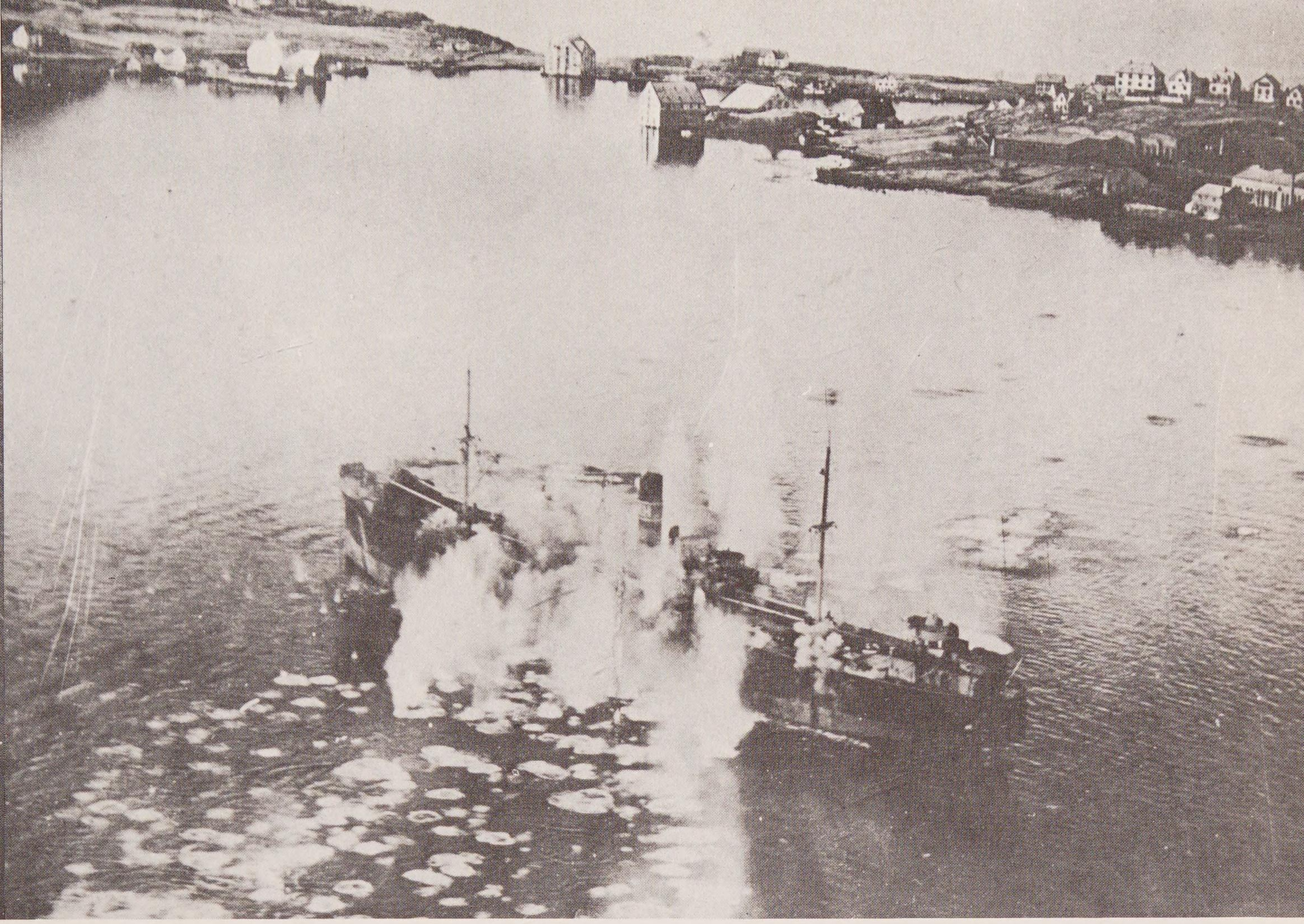


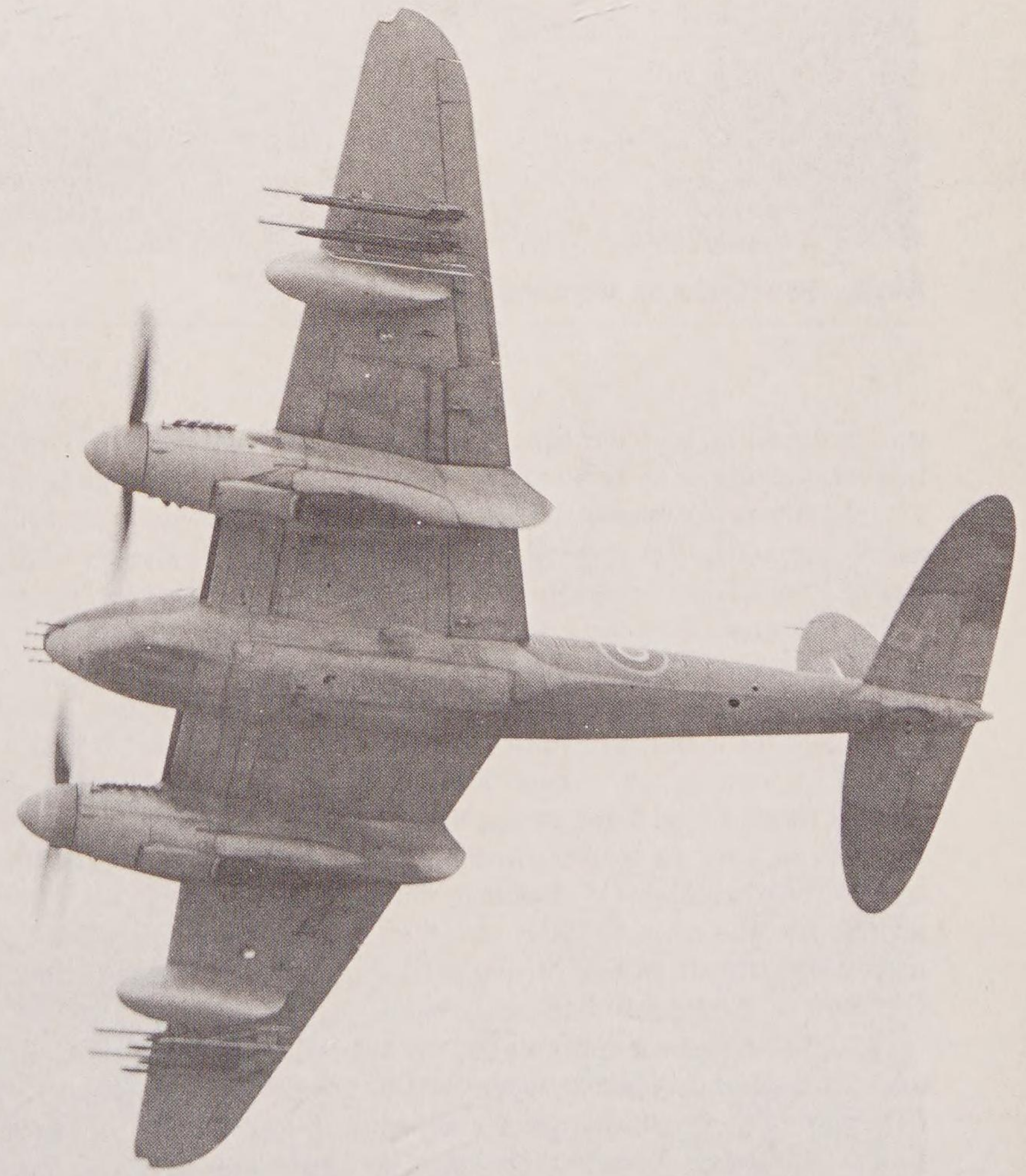


A combined attack by the Banff Wing on shipping in Aalesund off Southern Norway.



FB.VI RS625, NE-D of No. 143 Squadron being flown by Squadron Leader David Pritchard, as part of the Banff Wing.





RS625 with the heavy framework between the rocket racks and the fuel tanks in case the tank moved sideways on dropping and fouled the projectiles.

**Mosquito attacks on shipping.**

under the wing, which meant removing the inboard pair of RP rails, but mounting the rockets in pairs on the other two. When going into attack, the tanks had to be jettisoned, and they sometimes broke away sideways. To prevent these tanks wiping off the rockets, a heavy steel structure was hung in between, adding more weight and drag. On one occasion, a tank did swing sideways on the aircraft being flown by the strike leader, Wg Cdr Foxley-Norris. It hit the aircraft by the fuselage roundel and fractured the fuselage, nearly breaking off the tail. The pilot had radio failure at the same time, so one of his colleagues warned him by Aldis lamp not to make any violent moves. Suddenly everyone started overtaking him when he thought he was the leader, until he realised they were under attack by FW 190s, and he was unable to make violent manoeuvres. Fortunately he was able to take cover in nearby cloud and lose the attacking aircraft, but on return to base it was surprising to find that the back of the aircraft had not broken.

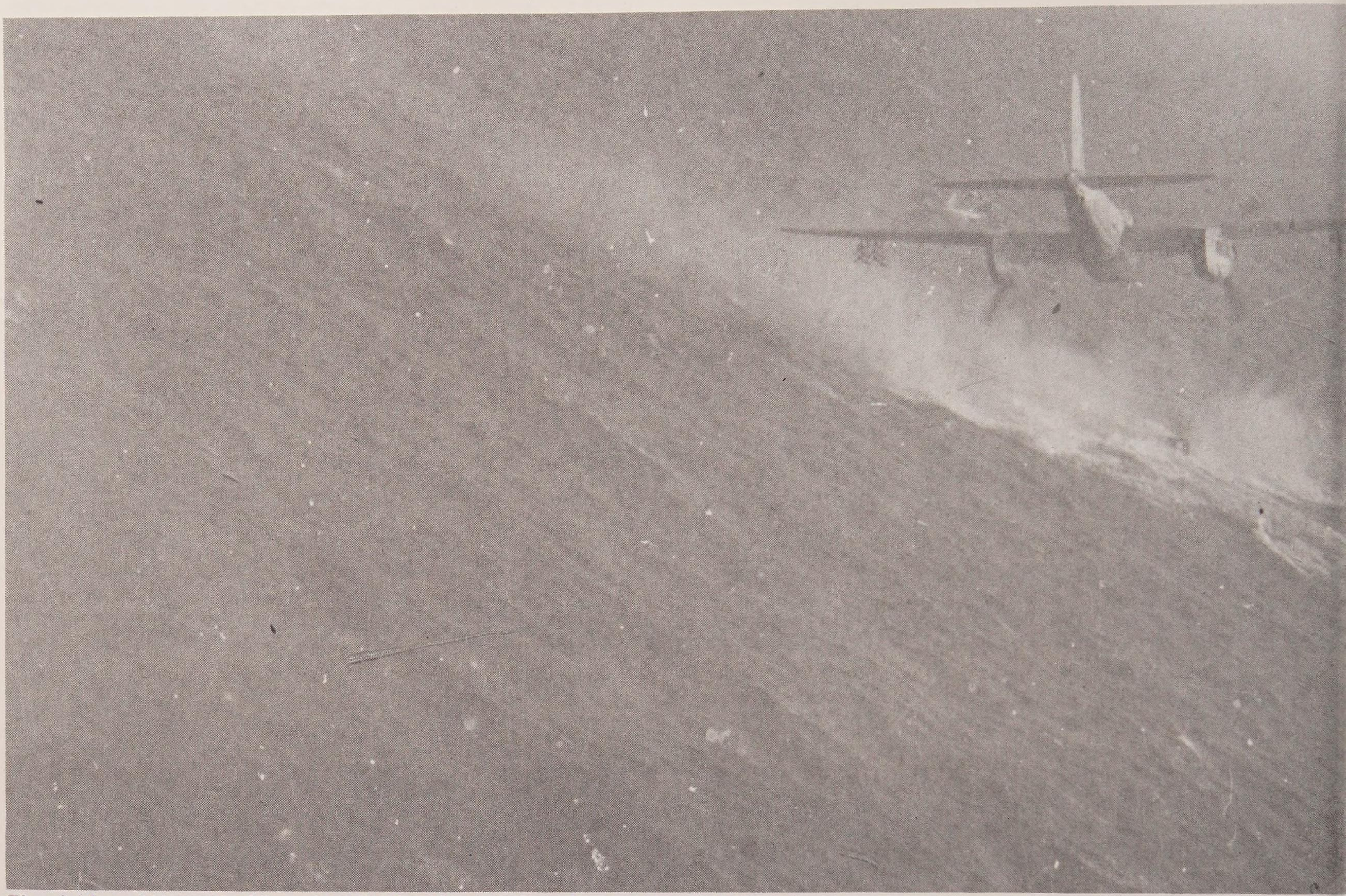
No 235 Squadron commenced rocket strikes in February 1945, and delayed-action bombs were used by bouncing them down 914m (3,000ft) cliffs on to shipping sheltering in the narrow Midgulen Fiord. Although bombs were seen to burst amongst the ships, setting some on fire, the fiord was so narrow that it was not possible to see what damage had been done. In March the Mosquitoes began operating without Beaufighters, shipping being the main targets, although occasional land targets and aircraft were hit. On some of the larger operations Vickers Warwicks of 279 Squadron dropped survival gear to ditched crews.

Some of the more spectacular attacks were those on shipping in the heavily-defended harbours of Aalesund and Porsgrunn. On March 17, 235 Squadron led an attack with 248 on shipping in Aalesund harbour, when 31 Mosquitoes used cannon and RP against six ships. Despite heavy flak, one ship was hit by 32 RPs, 14 below the waterline, and another received 37 hits, all but six below the waterline.

While many squadrons in Europe were slackening off in April, the Coastal Strike units were just as active, a film Mosquito usually going along to record the successes in addition to the cameras fitted to the strike aircraft.

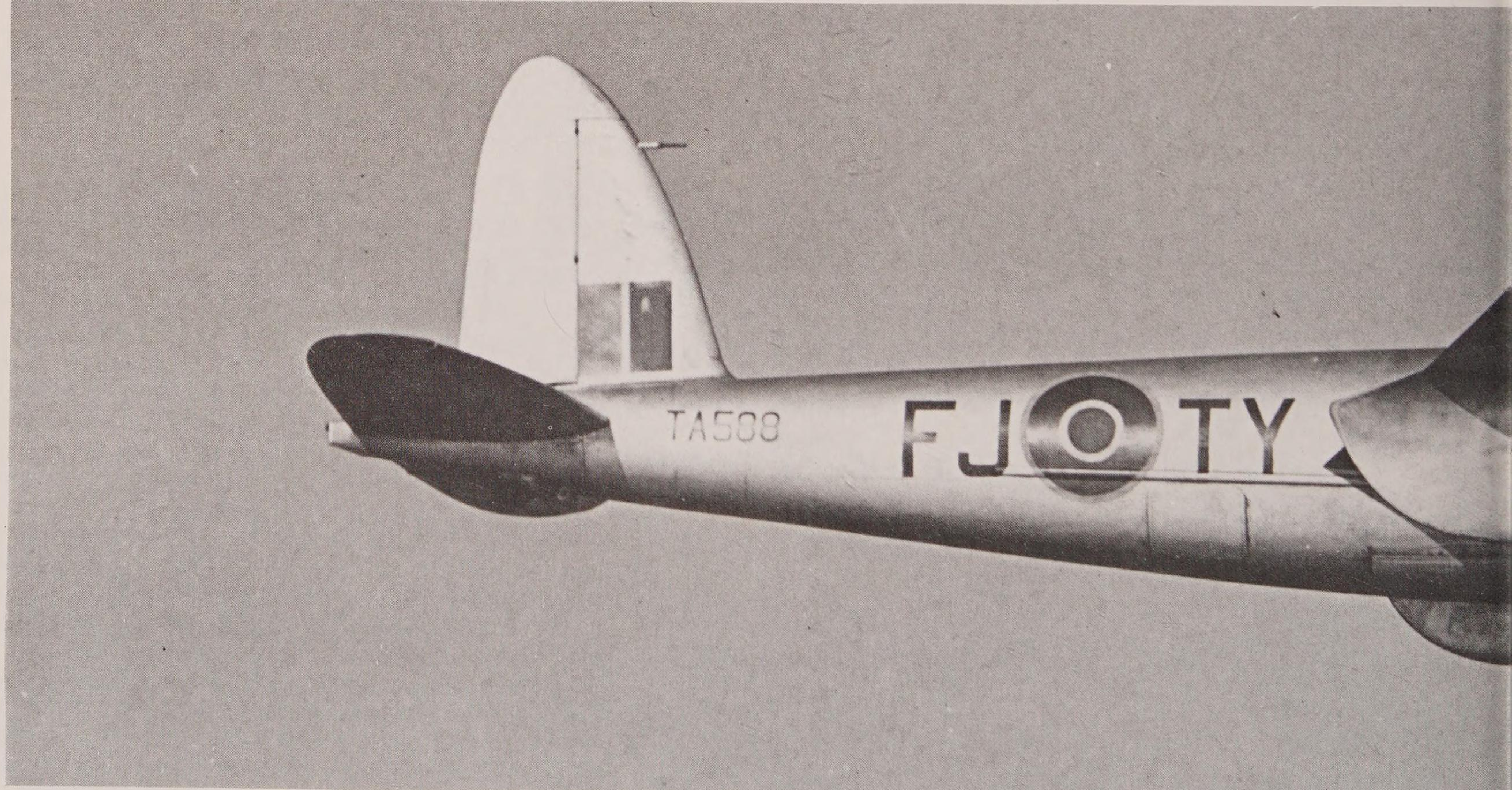
On April 9 came the climax to the U-boat search, when 37 Mosquitoes of 143, 235, 248 Squadrons were patrolling the Kattegat looking for shipping. 143 was taking up the rear, led by David Pritchard, who had been briefed to look after any small targets by breaking away. They saw some wakes of ships in the bright afternoon sun and the leader called for "Flatbed" to break away and investigate. As they turned into their port side, the wing man called up that he had seen U-boats. The nine aircraft roared into attack out

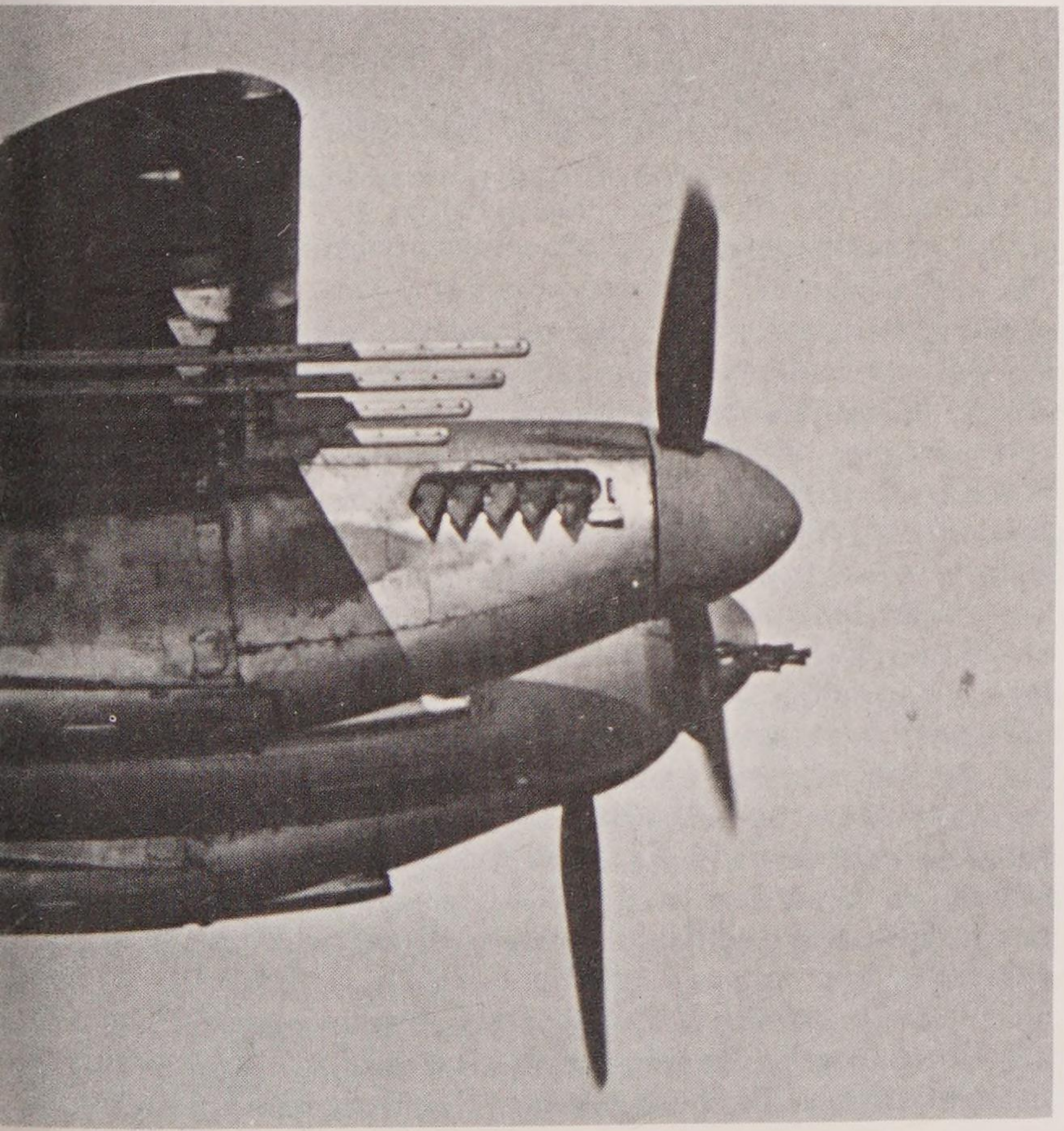
The sinking of three U-boats in the Kattegat by No. 143 Squadron, led by Squadron Leader David Pritchard.



**The sinking of *U-2350* by Mosquito Mk.VIs of No. 248 Squadron on May 2, 1945.**

**A post-war operated Mosquito FB.VI TA588 fitted with rocket rails.**





of the sun at low level and were not spotted until it was too late. Hearing the action, the rest of the wing turned back to add their weight to the attack. The U-boats crash-dived, but too late, as one popped up like a cork and exploded violently, sucking down the unfortunate 2nd TAF photo Mosquito in its water spout. All three submarines, U–804, U–843 and U–1065 were claimed and confirmed as destroyed. Despite the loss of the photographic aircraft some fine combat shots were captured on film.

A further German submarine, U–251, was sunk in the Kattegat on April 19, and two days later a formation of 45 Mosquitoes from the Banff Wing bound for the Kattegat came across 18 Junkers torpedo bombers about 150 miles off the Scottish coast on their way to attack allied shipping. At least nine of the enemy failed to return to base. Then, at a late stage, 404 Squadron was converted from Beaufighters to Mosquitoes, half the Squadron commencing conversion at Banff on March 24 and the remainder following on April 3. On their first operation, a Bv.138 flying boat was destroyed at anchor.

254 Squadron was still operating Beaufighters from North Coates, but there was a threat from U-boats and midget submarines against shipping in the Channel at night. To combat this, five Mosquito MkXVIIIs were attached in March 1945, and attacks on U-boats began on April 12, but results were inconclusive. The sea between Norway and Denmark was patrolled continually during May to avoid a last stand by the Germans in Scandinavia, one success being the sinking of U–2350 with rockets by 248 Squadron on May 2.

The final shipping strike came on May 4, when a large and well-defended convoy was attacked near Kiel, resulting in a massive battle. A total of 48 aircraft attacked, including eight of 404 Squadron, who were taking part in their second and last major strike, along with 18 Mustangs and three Air Sea Rescue Warwicks. One aircraft flew over so low that the top of a masthead complete with a German ensign, became embedded in its nose.

When VE-Day arrived, hostilities ended for most of the Allied Air Forces, but Coastal Command continued operating to keep an eye out for rogue submarines who were either unaware that the war was over or did not want to know. Operations ended on May 21, when 143 and 248 Squadrons each supplied two Mosquitoes for an anti U-boat patrol, but found only E-boats.

The Mosquito fighter bombers had more than justified their existence. They proved themselves in the intruder role, hitting aircraft, airfields and other targets. Bombs, rockets and fuel tanks could be hung under the wings, the attacks made efficiently and at high speed. The Mosquito was a difficult and small target for navy gunners. Ernst Heinkel, the famous German aircraft designer, once said of the Mosquito: "that is the aircraft I would like to have designed", and he kept a picture of the aircraft in pride of place in his board room.

# MOSQUITO FIGHTER OPERATIONS

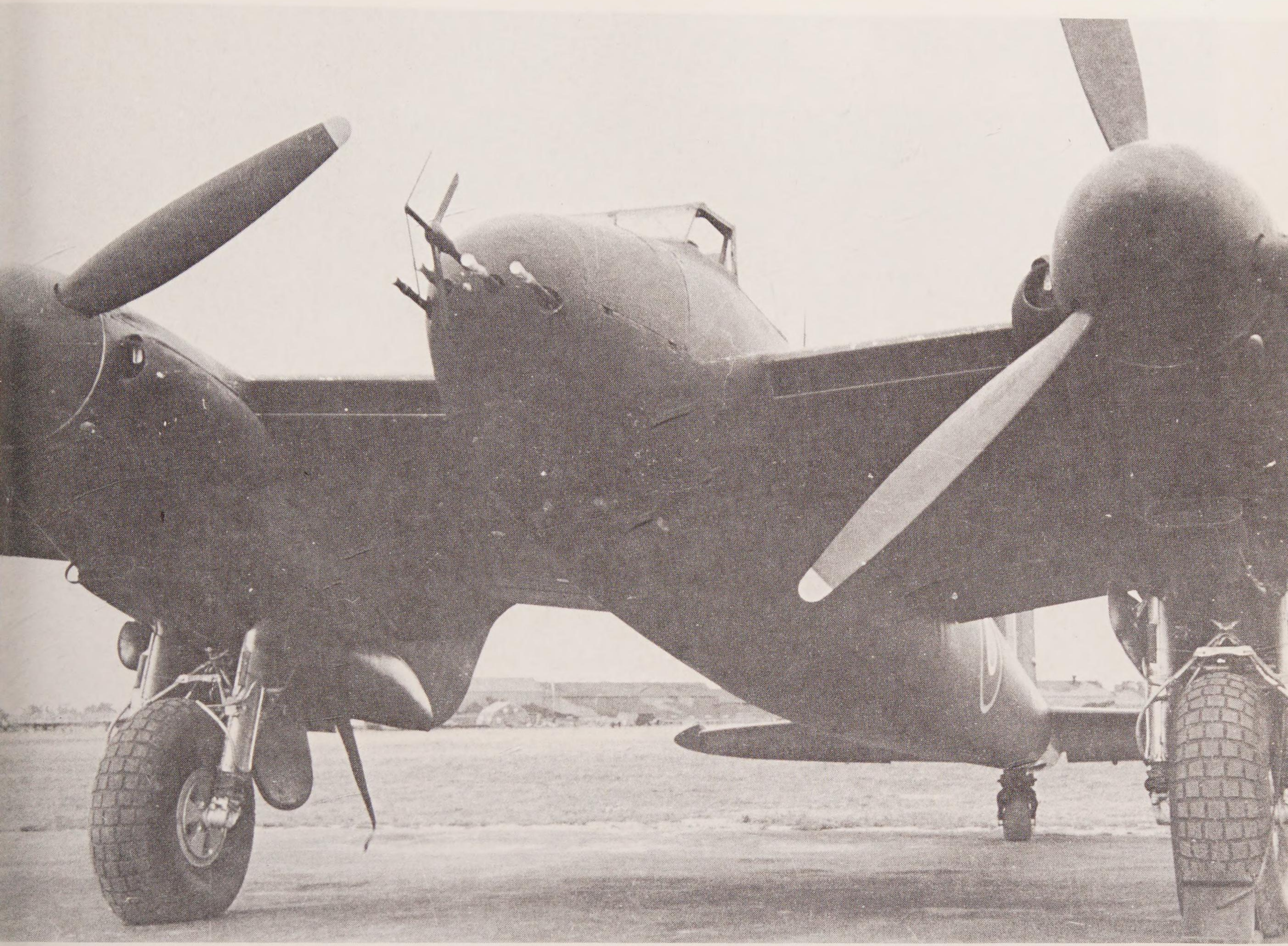
**The fighter prototype W4052 flies over the B.MkV prototype W4057 at Hatfield.**

Although the Mosquito was originally conceived as an unarmed bomber and never carried defensive armament in service, it might well be claimed that it was also a highly successful day and night fighter when fitted with a destructive offensive battery of machine guns and cannons. The two roles planned for this version were for long range convoy escort and night fighter, the requirements being endurance, good load-carrying capability for the heavy radar equipment, the ability to carry two crew and a high top speed. The Mosquito had all these attributes, and was highly manoeuvrable.

As already recorded, the Mosquito fighter prototype, W4052, made its maiden flight from a field adjacent to Salisbury Hall on May 15, 1941. By the end of July, having completed its initial test flying, it was being modified to have Airborne Interception (AI) Radar installed in the nose for development in the night fighter role. The most obvious external feature was a fixed arrowhead aerial in the extreme nose, projecting between the two pairs of machine guns. Later versions were fitted with a small radar dish scanner protected by a nose radome. The long range convoy escort version was an F.II without radar, later developed into the FB.VI for intruder operations and dealt with in another chapter.

Therefore the Mosquito's main fighter role was as a radar-equipped night fighter, to try to intercept attacking enemy bombers. The need for these aircraft was extremely urgent, taking precedence over the bomber versions, and the first night fighter unit to form was 157 Squadron, based at Debden under the Command of Wg Cdr Gordon Slade. The Squadron was formed on December 13, 1941, and to enable training to commence a dual control MkII Mosquito, W4073, was delivered to Debden's satellite, Castle Camps, on January 26, 1942. Like most satellites, this airfield was poorly equipped, had poor accommodation, and was bleak, isolated and inhospitable. Despite all of these disadvantages, particularly noticeable in the bitterly cold weather, it became the squadron's base in January.

As with most squadrons receiving a new type, the build-up with fully operational aircraft was very slow, many being delivered to the squadron from the MU with service equipment installed but no radar. By mid-April 16 NF.IIs with radar had been delivered, but only seven crews were trained. Various adjustments were made in the cockpit, based on initial crew experience with night flying, as everything had to come to hand instinctively, especially in the stress of battle. On April 6th 151 Squadron received its first Mosquito NF.II at Wittering, the plan being to convert "A" flight to the new aircraft while "B" flight retained its Defiants. The squadron



**The double arrow head radar aerial as fitted to the NF.IIs in the extreme nose.**

commander was New Zealander Wg Cdr Smith, and the station commander was Grp Capt Basil Embry, who also flew the Mosquitoes and was later to fly on the hazardous fighter bomber operations.

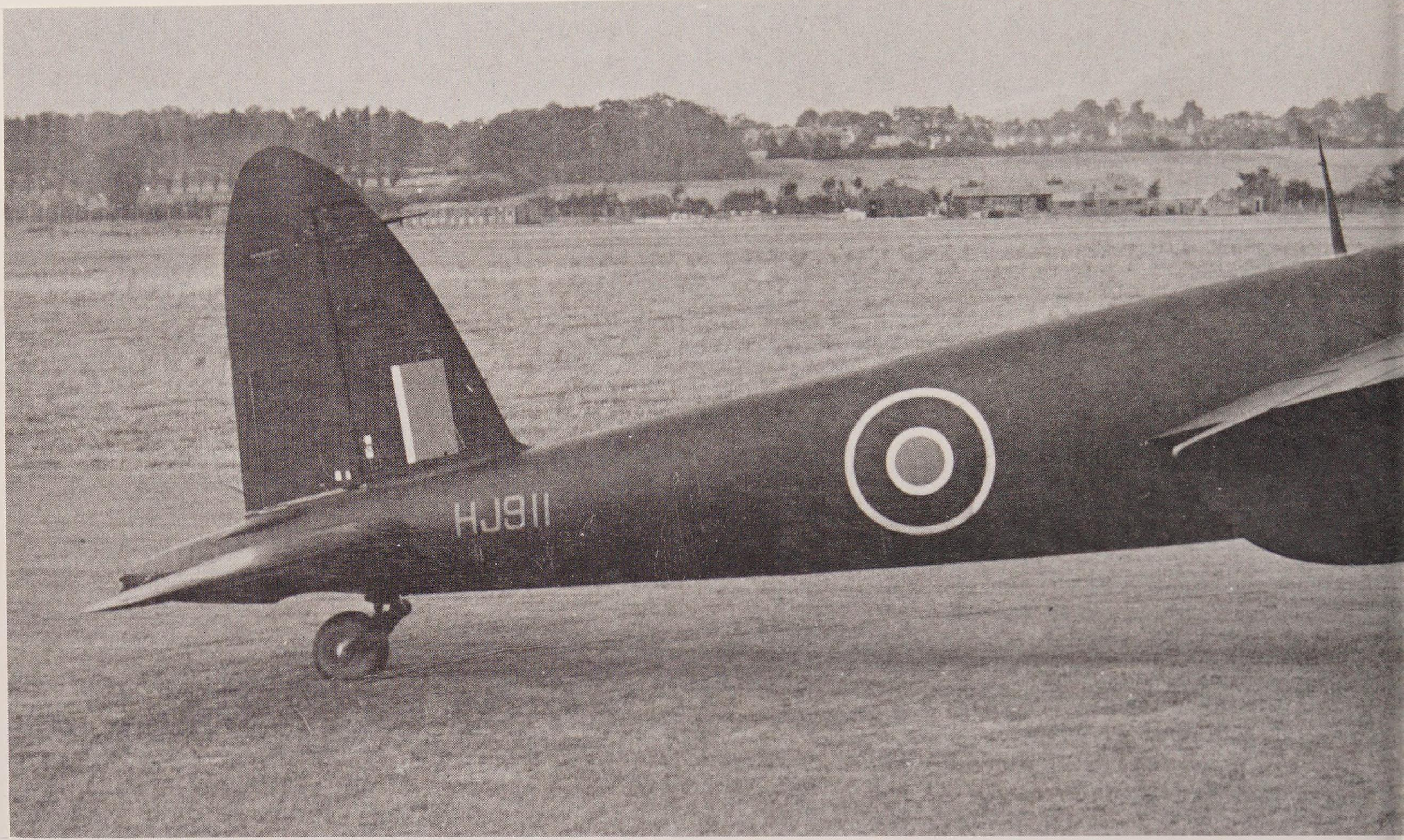
Having converted on to the aircraft, the crews had to learn how to use it as a machine of war, usually practicing interceptions in pairs and taking turns to be target and attacker. Training also included working in close co-operation with the ground controllers, who vectored the Mosquitoes within AI range of their targets.

The worst problems encountered during training were the blinding flash when the nose-mounted machine guns were fired and trouble with the exhaust shrouds. The flash from the guns instantly destroyed any night vision the crews may have acquired, which was essential in order to obtain a clear and positive identification before the destruction of a target. A venturi device was therefore fitted which sucked the flame downwards. The flame-damping exhaust shroud not only caused about 16km/hr (10mph) speed loss due to drag, but frequently burnt through, resulting in the need for about 60 aircraft to be modified. Once these problems and a number of minor ones had been ironed out, the two Squadrons developed a healthy rivalry to be the first Mosquito Night Fighter unit to claim a victory, the first operational patrol being made by 157 from Castle Camps on April 27. However, the only contacts were friendly aircraft until April 29, when a Do217 was located but escaped.

On April 30, 151 Squadron joined the battle. The main hazard was near misses. Although the Mosquito was fast, its speed advantage over some of the faster enemy aircraft was relatively low, and resulted in long, running battles. Additionally, the enemy aircraft which flew over at low altitudes avoided early detection by radar, and made their plotting very much more difficult.

Training continued (not without loss of aircraft and men) and the first successful interceptions were claimed at the end of May. On May 29 a 151 Squadron Mosquito claimed a probable when a German bomber was believed to have crashed into the North Sea after a running fight. The Mosquito returned to base on one engine and with damage to its wing and tailplane. The next night 157 Squadron also claimed a probable, with a Do217 in the English Channel off Dover. Subsequent records suggest that the 157 Squadron claim was a confirmed victory, but that the previous night's aircraft was only damaged, so the honour of claiming the first Mosquito night victory belongs to 157 Squadron.

The expansion of the night fighter force increased when "B" flight of 264 Squadron at Colerne was equipped with their first Mosquito



**Leavesden built Mk.II HJ911 fitted with the flame damping exhaust shroud.**

on May 3, to replace its Defiants. Amongst these early aircraft was W4053, which had been converted to a T.III after development flying as a turret fighter. Conversion of the pilots usually followed a couple of hours on an Oxford, but in some cases they transferred direct from Defiants without any twin-engined experience. 264 Squadron's first operational night patrol occurred on June 13, although enemy activity had run down somewhat. Towards the end of the month, 151 Squadron claimed their first definite victory, scoring four confirmed and three damaged, with another five confirmed during July. In the space of half an hour on one night the 151 Squadron CO Wg Cdr Smith, claimed a probable and two confirmed. However, 157 Squadron had less success, owing to the fact that few enemy aircraft entered the sector that they were briefed to defend.

In the summer months, with the long days and short nights, the raiders could often be seen against the Northern Lights, the highest combat taking place at 4,877m (16,000ft), making radar detection of the majority of the lower-altitude attackers more difficult. The Mosquito had difficulty slowing down sufficiently to avoid overshooting the less speedy raiders and alerting them to the night fighter's presence. The idea of an airbrake was considered but abandoned, and the most effective way to reduce speed was to put the propellers into fine pitch and open the radiator flaps to create more drag. The aircraft would usually be going too fast to risk the lowering of its flaps or undercarriage. The AI radar was still in its infancy and could be erratic and temperamental, depending upon its design, production quality, installation and maintenance.

The first success by 264 Squadron was a Ju88 shot down on July 30. There was no doubt about its confirmation because it fell near Malvern, rather than being lost at sea. On the previous day, 85 Squadron received their first Mosquito T.III at Hunsdon, but it was crashed after one day's use and they had to wait until August 15 for their first MkII, ready to commence patrols three nights later.

On August 22, Gordon Slade scored another victory for 157 Squadron, when a surprised Do217 was shot down at Worlingworth in Essex, two of the crew escaping by parachute.

While these early operations were getting under way, various camouflage finishes were in the experimental stage. The black velvet finish was supposed to be resistant to searchlights, but it caused a 24km/hr (15mph) speed penalty due to drag and gave the aircraft a strong silhouette, especially in moonlight and against cloud. The most satisfactory finish was found to be modified day fighter finish.

Operations were not confined to night time, as during poor visibility radar was just as vital. The first day combat took place on September 30, when Wg Cdr Clarke of 157 Squadron shot down a Ju88 48km (30 miles) off the Dutch coast. 85 Squadron fought its first combats in a daytime fight on October 19 with inconclusive results, but 157 Squadron claimed another Ju88 the same day.

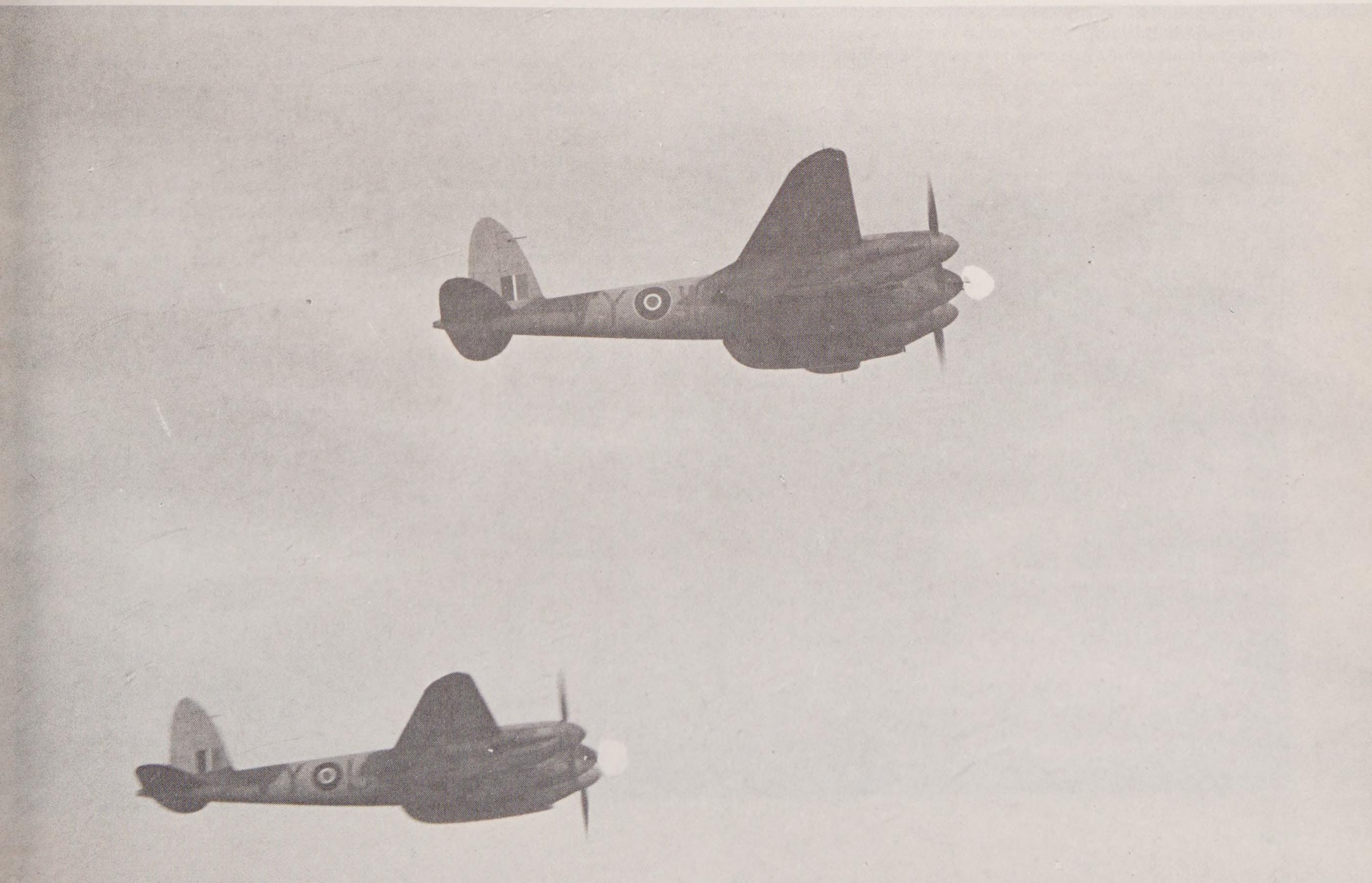
During the last months of 1942 the night fighter force built up dramatically with the conversion of four squadrons to Mosquitoes. At Church Fenton 25 Squadron received their first three MkIIs on October 21, and made their first operational sortie on December 17 without making contact with the enemy. The Canadian 410 Squadron at Acklington, previously equipped with Beaufighters received their first T.III on October 24, but morale was low because the unit had no enemy aircraft to its credit after sixteen months of operations. Its first operational Mosquito patrol was on December 6. No 307 (Polish) Squadron received Mosquitoes at Exeter in December 1942, and to help with the training the engineering officer translated the pilot's notes and maintenance handbook into Polish. They were ready for operations on January 14, 1943, but made n

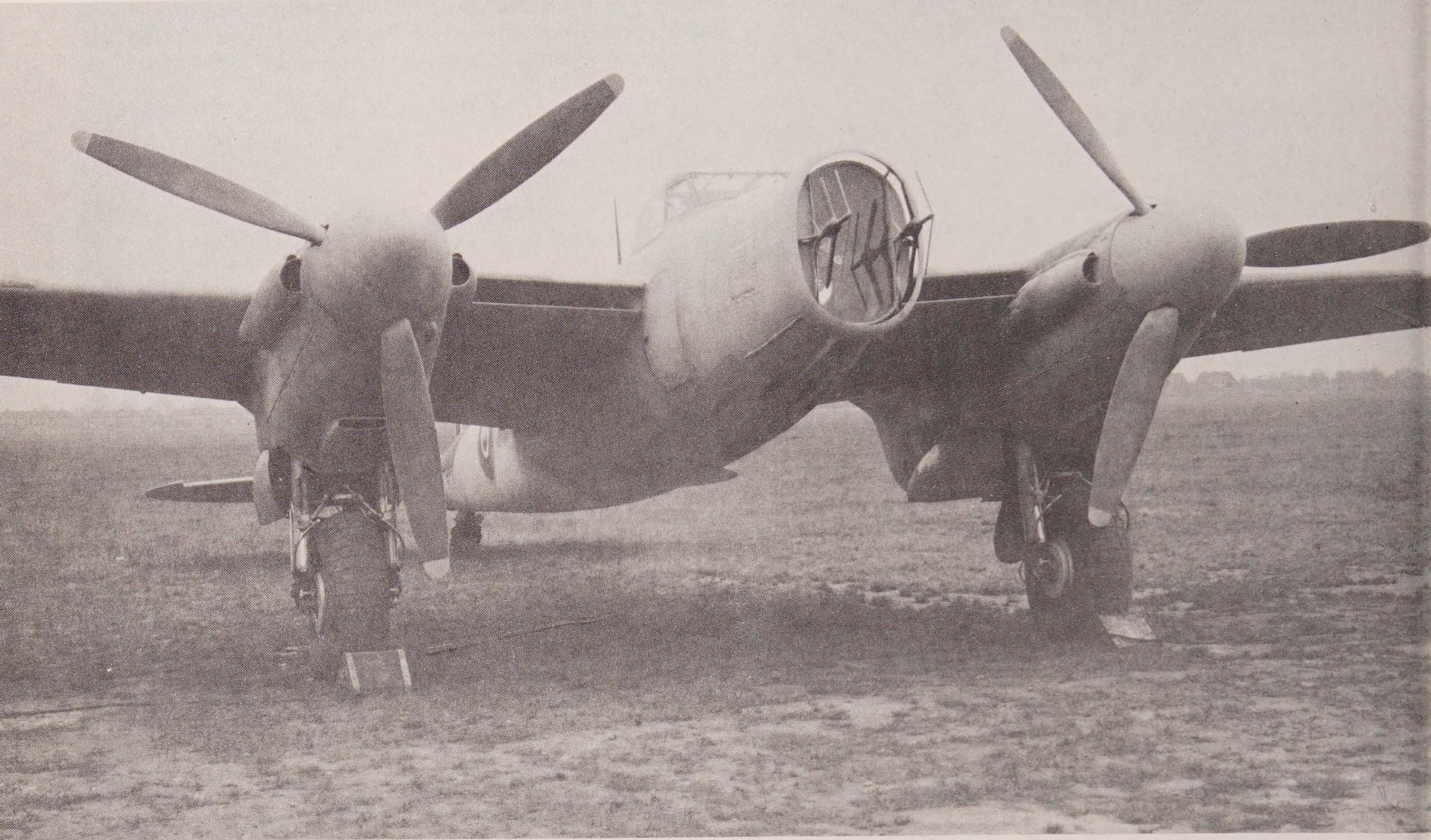
contact with the enemy. The fourth unit was 456 Squadron, which had three MkIIs delivered to Valley by the end of 1942 and commenced operations from the exposed and sandy airfield on January 22.

Britain was protected all round, from the North-East coast to the North-West, by individual squadrons ready to defend against enemy night bomber attacks wherever they came. Unlike the other Mosquito operations, the night fighters did not operate in Wings, because potential attacks covered such a wide area that with larger but fewer concentrations the enemy would stand a good chance of escaping while the defending fighters were still flying to the designated area.

Another problem in the damp winter weather was water soakage into the balsa sandwich between the plywood skins. The Mosquitoes were widely dispersed around the airfields as protection in the event of attack, and were rarely under cover unless undergoing maintenance or repair. All cut outs were well covered with doped fabric to act as a water proofing, but this often cracked and allowed damp to seep in like blotting paper. Not only did this cause deterioration of the structure, but it also could increase the weight and have alarming effects on the position of the centre of gravity. One waterproofing modification was to fix an external wooden fairing strip over the access door to the starboard side of the fuselage behind the wing trailing edge. This prevented water from entering the access hatch surround. Other water-proofing steps were also taken to avoid having a high number of aircraft out of service, which could sometimes be as many as half the squadron strength.

**A pair of NF.IIs of No. 85 Squadron, but the censor has been busy and crudely touched out the radar aerials.**





**Unarmed Mk.II W4087 fitted with a Turbinlite searchlight in the nose for trials which proved the idea to have little value.**

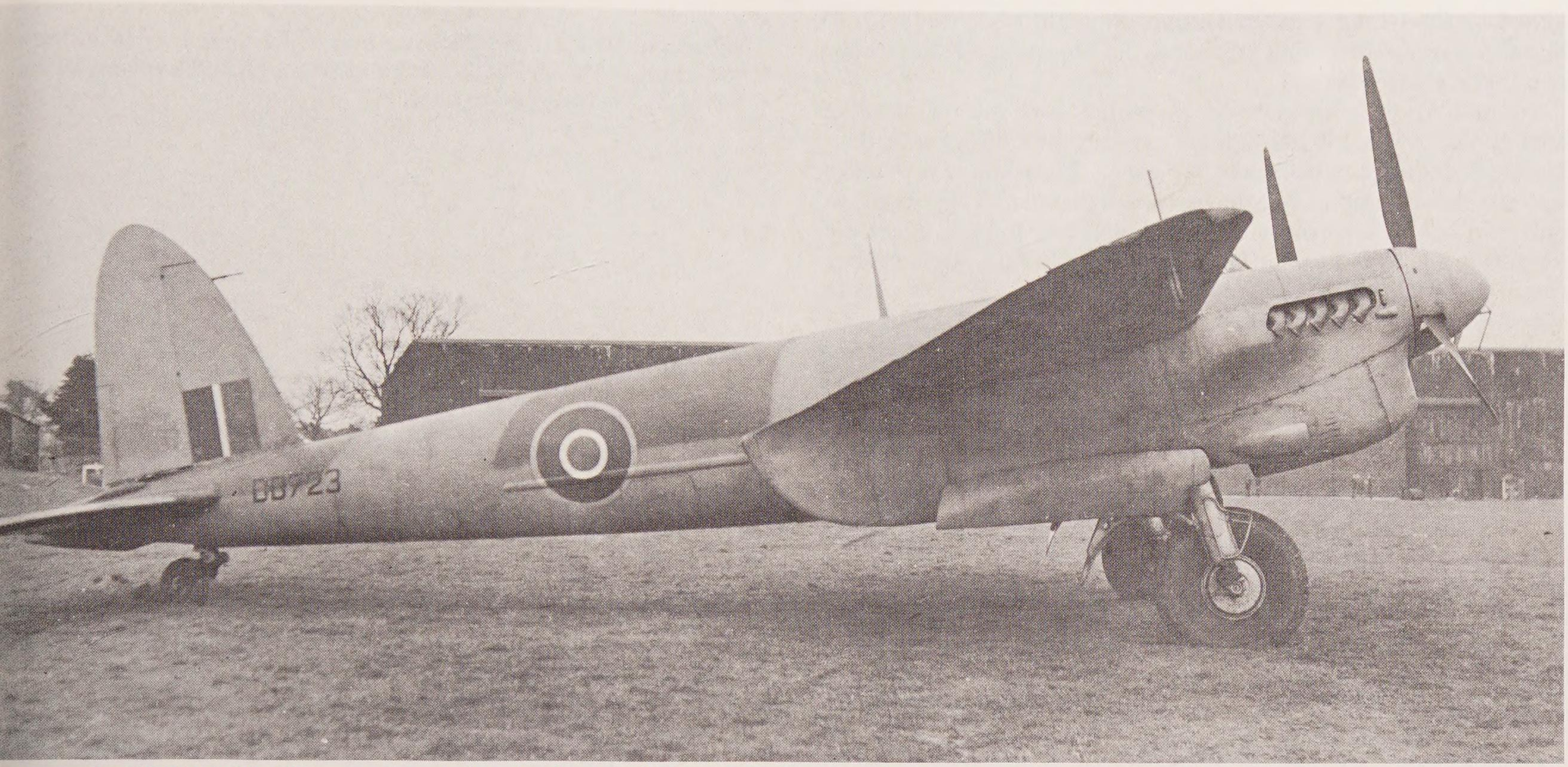
Despite the use of radar in the Mosquito, some official interest was still being shown in a Turbinlite aircraft with a large searchlight in the nose to illuminate the target aircraft for another fighter, which would attempt to shoot it down. Ten squadrons of Havocs and Bostons had employed this system, but few operations had been carried out. Then unarmed Mosquito II W4087 was converted by Alan Muntz at Heston to have one of these curiosities in the nose, the work being completed by the end of 1941. This aircraft arrived at 151 Squadron for service trials on January 16, and was flown by a crew from 532 Squadron. On February 18 it was passed to 85 Squadron, who soon returned the aircraft, with an adverse report, to 1422 Flight at Heston. It appeared that whoever had extolled the virtues of such an installation had little practical experience of the problems involved.

Wing Commander John Cunningham had taken over as CO of 85 Squadron on January 27, 1943, having gained the majority of his final total of night fighter victories flying Beaufighters. However, the higher performance of the Mosquito was needed to catch the enemy raiders, although its cockpit was more cramped. Another problem was the flying debris that often resulted from a successful attack on an enemy aircraft. The air-cooled engines of the slower Beaufighter were better able to cope with this debris, whereas the liquid-cooled Merlins and the radiators in the wing leading edges were very prone to damage, many a successful sortie being completed on one engine.

John Cunningham and his observer, Rawnsley, used to stalk their prey and, when it was sighted, drop down below the target to identify its silhouette to ensure that it was not an allied aircraft. Having determined that it was an enemy, the Mosquito would then fall back and climb to the same level before firing its guns. If ther was an alert German rear gunner, there was a good chance he coul spot the Mosquito, and the enemy aircraft could make his get-awa with the rear gunner firing parting shots. On one occasion Joh Cunningham's windscreen was hit by the enemy, but although was badly damaged the bullet-proofing stopped the shells. Th windscreen is now preserved at Hatfield, but has probably suffere more since it was put on display and now looks a lot worse than i was originally. It would probably have been an advantage to hav upward-firing guns, an idea the Germans adopted with grea success. On the night of Match 3/4, John Cunningham near added two Dorniers to his total, but although he had the aircraft i his sights the guns failed to fire owing to an electrical lead becomin disconnected.

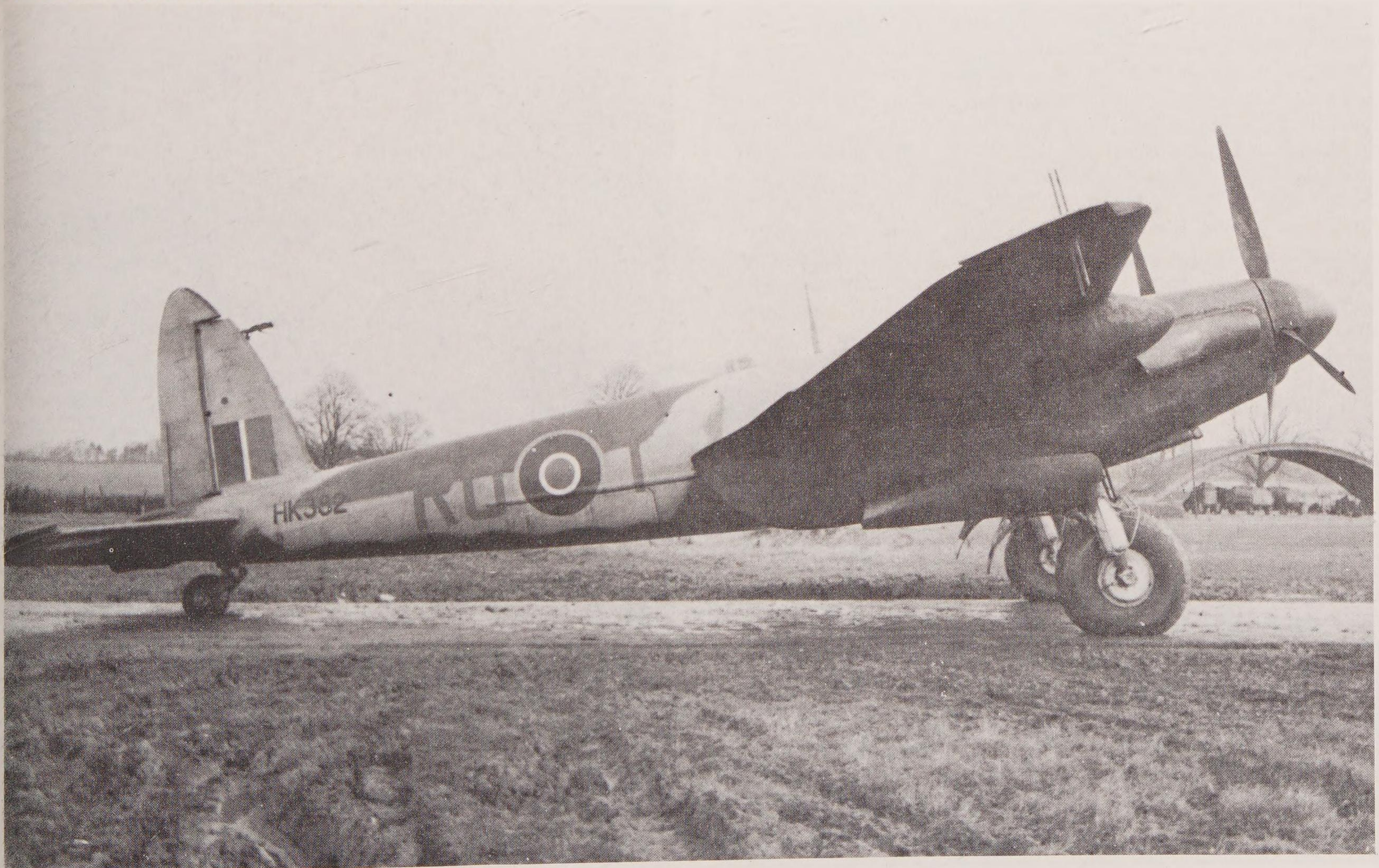
At the end of February 85 Squadron began to receive th Mosquito NF.XII, equipped with the improved centimetric rada housed in a radome which necessitated the removal of the fou nose-mounted machine guns. The loss of the machine guns wa more than compensated for by the vastly improved radar, and th squadron strength soon built up to 12 of the new type. Joh Cunningham had a preference for the bomber-type control whee instead of the fighter-type stick, as the wheel gave better leverag and therefore manoeuvrability. The forward view around th gunsight could be improved by repositioning the rudder tri control to the side of the cockpit.

By the spring of 1943 enemy night bombing activity had eased o and a number of the night fighter aircraft were allocated to Rang operations, as described in the fighter bomber chapter. In som cases, the defending Mosquitoes shared victories with anti-aircra gunners on the ground. This brought an added risk to the busines as ack-ack was not always very accurate and, if it was, it could



Mosquito NF.II DD723 with experimental underslung radiators replacing the wing leading edge ones, possibly in an attempt to make them less vulnerable to damage from debris. This was not adopted in production, as the drag was higher.

NF.XIII HK,382 RO-T of No. 29 Squadron at Hunsdon. It served with the Squadron, mainly on "Night Rangers" from September 20, 1944 until it was destroyed in a crash on March 16, 1945. *IWM*



aimed at the wrong aircraft. During the night of April 14-15, 85 Squadron recorded its first kills using the Mosquito NF.XIIs when two Do217s were claimed.

In mid-April, a new threat presented itself in the form of formations of fast FW190 fighters carrying bombs beneath their fuselages and drop tanks under the wings. Their aim was to make fast attacks on London, but the first was a disaster to the enemy, as only two bombs were dropped on target. Three aircraft out of the formation of 30 landed in error at West Malling, and another crashed nearby. The FW190 was so fast that the Mosquito had little speed advantage, so 85 Squadron moved to West Malling to be nearer the action. It took over from 29 Squadron, which went to Bradwell Bay to exchange its Beaufighters for Mosquitoes, and 157 Squadron moved into Hunsdon in place of 85.

This redeployment paid off on the night of May 16-17, when Mosquitoes of 85 Squadron took over from some unsuccessful Typhoons and claimed five victories in the one night against the FW190s, from a total of 17 being operated at the time. The first Mosquito crew to gain a victory over Britain was Sqn Ldr Green and Flt Sgt Grimstone, when they shot down one of these aircraft over Dover.

No 256 Squadron began to receive Mosquito NF.XIIs at Ford in May 1943, followed by 29 Squadron at Bradwell Bay the same month. On May 20, the last two NF.IIs built were delivered to 60 OTU for the training of aircrews.

On June 13 two FW190s entered 85 Squadron's sector, and one of them was shot down at 7,010m (23,000ft) by John Cunningham to become his seventeenth victory overall and his first in the Mosquito. German raids continued on a nuisance basis, but much less frequently. As radar techniques improved more enemy aircraft fell to our defending fighters.

During June, with the diminishing success of the FW190 attacks, a more serious threat appeared in the form of the Messerschmitt Me410, with a top speed of 624km/hr (388mph) and remotely-controlled 13mm guns on each side of the rear fuselage. For offensive weapons it had two forward-firing 20mm cannon and two 79mm machine guns, and could carry a bomb load of 500kg (1,102lb). An 85 Squadron Mosquito XII was the first to catch a Me410 on July 13-14 so, despite their performance, the Mosquito could still cope. A second was shot down two nights later by 85 Squadron, and 256 Squadron claimed a third at the end of the month, heralding the start of a series of successes against these raiders. However, the Me410 crews had learned from the Mosquito intruder operations, and mingled with the returning RAF night bomber formations, shooting down the bombers and proving very difficult to distinguish on radar. In some cases Me410s bombed the runways at the bombers' destinations, forcing the aircraft to remain airborne so that other Me410s could pick them off. The Me410 was very similar to the Mosquito in appearance, particularly during the dim light of night.

Mosquito crews claimed 17 victories during August and September, comprising seven Me410s and six FW190s. One of the FW190s was shot down into the sea off Aldeburgh by Wg Cdr Cunningham, who returned to base on one engine after being hit by debris from his foe. With a bomb under the fuselage and two long range tanks the FW190 slowed down sufficiently to make it an ideal target, provided the wreckage could be avoided.

In October the Junkers Ju188 developed version of the Ju88, began a mini blitz of London and the Home Counties. These aircraft also suffered losses by the Mosquitoes.

On November 8 the first Mosquito NF.XIII drew blood when 488 Squadron destroyed an Me410 off Clacton. This variant mainly differed from the MkXII in having the universal wing, as fitted to the FB.VI, which allowed extra fuel tanks to be carried to give an endurance of nearly six hours. During December 29 Squadron

**Mosquito NF.XII of No. 85 Squadron which shot down a Ju 188 o the night of March 24/25, 1944 and although badly singed by the flying debris returned to base.**

began to achieve successes with the new version. On November 9 307 Squadron was moved to Drem in Scotland, changing from "Insteps" to night fighter defence with MkIIs and MKXIIs. Although they expected a quiet time, they claimed their first victory on November 22.

There was still a demand for better performance, particularly at heights above 6,096m (20,000ft), so as well as cleaning the aircraft up as much as possible to reduce drag, trials were made with nitrous oxide injection into the engines. The speed increase was nearly 80km/hr (50mph) at 8,534m (28,000ft) and, using this improvement, John Cunningham bagged an Me410 off Le Touquet on January 2-3, 1944.

The MkIIs were finally phased out of operational flying by the end of January 1944, but before this a 410 Squadron crew claimed three Do217s on the night of December 10 while defending Chelmsford, thus setting a new Mosquito record.

Heavy German raids were aimed at London on the night of January 21-22, 1944, although only a relatively small number reached their target. Amongst the defending Mosquito night fighters, 85 Squadron sent up four MkXVIIs equipped with the improved SCR 720 radar. A total of nine raiders fell to Mosquitoes that night, drawn from 25, 29, 96, 410, 456, 488 and 151 Squadrons, as well as 85. 151 Squadron claimed the first Heinkel He177 to be shot down over Britain. These German raids increased during the succeeding months, and in many cases attempts were made to jam the British radar by dropping "Düppel", the enemy version of "Window", a series of strips of tin foil which interfered with radar waves. Fortunately, the SCR 720 radar could overcome this interference to a certain extent, and radar-directed searchlights helped to track down some of the enemy. By mid-March the Mosquitoes were defending London so successfully that the enemy began to try alternative targets in East Anglia and up the East Coast of England, which they hoped would be not so well defended. However, 25, 307 and 264 Squadrons proved the Luftwaffe wrong.

On March 27 Bristol was the target for over 100 raiders, eight of which were shot down. One of these, a Ju88, was claimed by 219 Squadron based at Colerne, who had commenced re-equipment with Mosquito NF.XVIIs the previous month and had just become operational on the type. On April 18 the last major attack of the series was made on London, an He177 being shot down over Essex by 410 Squadron, then based at Hunsdon. Other victories were also claimed by 96 and 488 Squadrons. Following this, enemy night bombing activity was reduced, the last major night raid being on the Portsmouth area on May 15.

Preparations then began for D-Day, when the defensive Mosquito night fighting squadrons were re-allocated to three new main duties. Six squadrons were to assist the 2nd TAF as part of 85 Group, providing night protection to the invading allied troops. Seven squadrons and the Fighter Interception Unit stood by to defend Britain and patrol the allied beach head until the V–1 flying bombs caused their activity to be diverted in that direction. The remainder were to be the defence against the air-launched flying bombs released from HeIIIs over the North Sea.

From the night of June 5-6, 1944, the Squadrons of 85 Group were on alert, and 264 Squadron opened the battle with jamming and defensive patrols. Additional units had joined the Mosquito night fighter force by this time, using even later marks with improved radar. 604 Squadron received NF.XIIIs in July. These were retained until disbandment on September 1, 1945. 604 Squadron wasted no time getting into action. On June 7, its first night over France after the allied landings, five enemy aircraft were claimed as destroyed, followed by five more the next night. Claims then grew at a slower, but steady rate, due to bad weather reducing the trade.

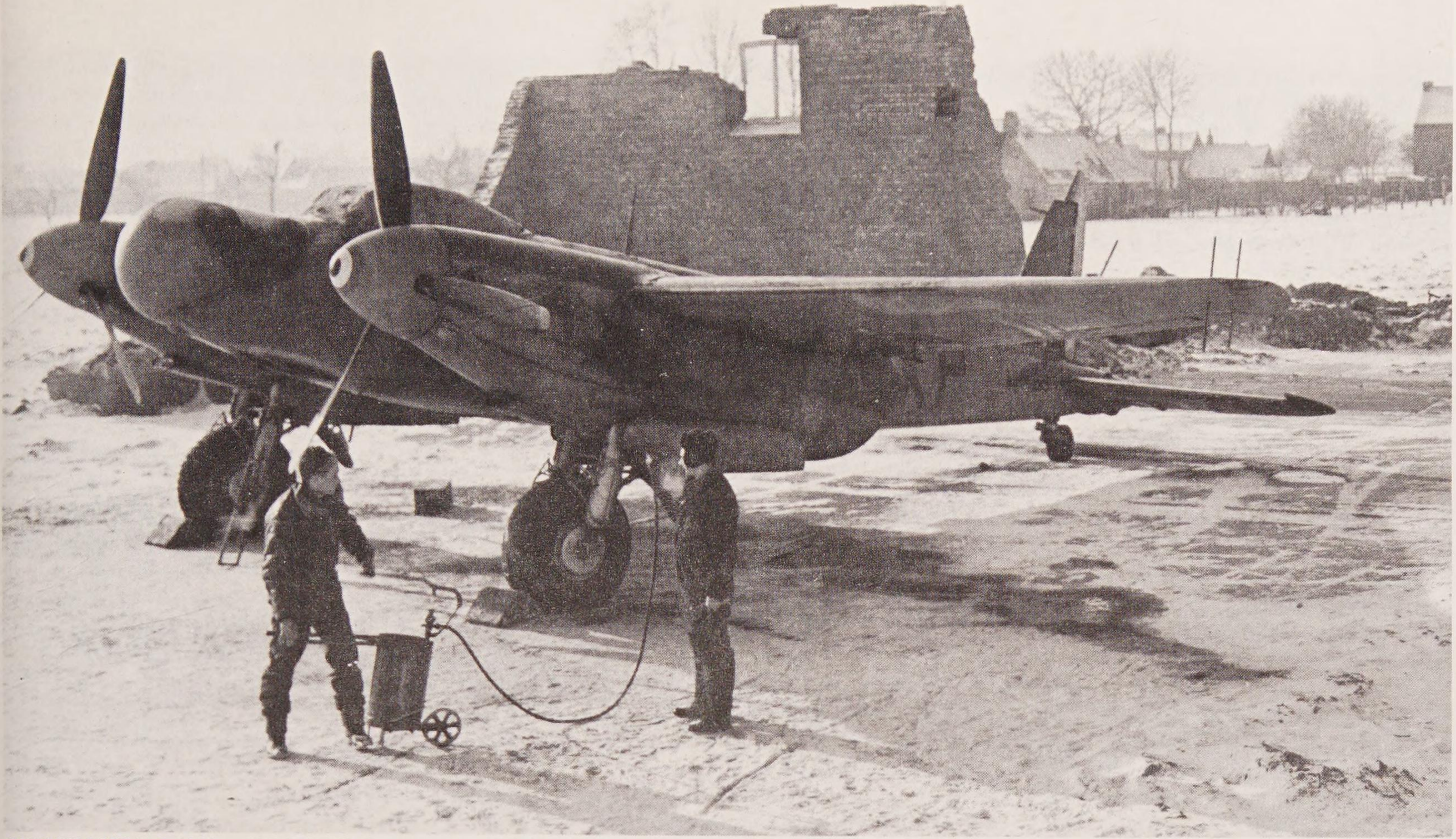
A new combination was caught one night in mid-June. It appeared to be a Ju88 with a glider bomb on top, but it was found to be an uncrewed Ju88 loaded with explosives, launched from beneath a guiding fighter such as a Bf109 or FW190. The V–1 flying bombs were first reported in the air on June 14 by a 418 Squadron fighter bomber crew flying on a Ranger Patrol. Of the ten launched on this small initial attack, four reached Britain, giving the Germans an idea of the range. Two nights later 244 V–1s were launched, of which 144 crossed the British coast, and 50 per cent reached London, the intended target. A 605 Squadron Mosquito FB.VI gained the first victory over one of these fast, small targets on the night of June 15. Destroying V–1s was not only difficult but hazardous, for if the attacking aircraft was too close the explosion of the V–1 could engulf the hunter. 96 Squadron, based on the path of these aircraft at West Malling in Kent, claimed their first V–1 on June 17 and raised their score rapidly to 24 by June 23. By this time about half the bombs were being destroyed, or crashing, before they reached London. The remainder, however, were causing much worry and damage, falling indiscriminately over the Greater London area.

Numbers 96 and 418 Squadron were quickly joined by 219 and 409 in the battle against the V–1s, 409 Squadron having re-equipped with NF.XIIIs in March as part of 85 Group. This unit had its first victory using Mosquitoes over the beach head on June 9, with three more the next night. It was then diverted to the "anti diver" patrols, as the V–1 operations were known, and claimed its first victory on June 18, rejoining 85 Group in the second half of July. Because of the high speed of the flying bombs, the most successful means of catching them before they reached their target area was to patrol above their normal altitude and gain speed by diving down behind them. It was also necessary to be within range over the English Channel, before the hazard of flying through the coastal gun belt, or between this and the South London balloon barrage. If an aircraft shot down a V–1 over the Channel, a full victory was credited; over land only half a victory could be claimed.

By mid-July nine Mosquito squadrons were committed to "anti-diver" patrols, 418 Squadron with FB.VIs starting them on June 17, to be joined on June 24 by 456 Squadron who found that the V–1s could be brought down when the slipstream of the Mosquito disturbed the flying bomb's gyro. A total of 471 V–1s was claimed by the full time anti-diver Mosquito squadrons, and a further 152 by the part-timers, the top score of 18½ going to Canadian Squadron Leader Russ Bannock. Meanwhile, the other Mosquito squadrons, including 85 Group, continued to build up their scores rapidly against German bombers, 97 being claimed by the end of July and a total of 200 being reached at the end of November.

On June 13 219 Squadron became the first unit to introduce the Mosquito NF.30 to service, 406 Squadron following the next month. Operations were begun in August, but trouble was experienced with the exhaust shrouds well into November, when satisfactory louvred shrouds were produced, allowing seven squadrons to re-equip with the new version before the end of 1944. Some NF.30s remained in RAF service into the late 1940s as part of the peacetime night defence force.

A new trick was tried by the enemy in early July, when they began to launch V–1s from HeIII parent aircraft. These combinations flew so low at night that they were very difficult to locate on radar, and were so slow and cumbersome that Mosquitoes had to fly close to stalling speed near the sea to get them in their sights. There was certainly no chance of flying underneath to identify the target. Batches of V–1s were air-launched on London, Portsmouth and Southampton in September, and 409 Squadron claimed the first confirmed victory against one of these combinations on September 25. 25, 68, 125 and 307 squadrons all joined in the patrols against them and a reasonable success was claimed, a total of 41 eventually being lost on operations. 68 Squadron had operated a mixture of MkXVII and XIXs since July, and converted to the Mk30 in



NF.XIII MM466 of No. 409 (RCAF) Squadron, which with 11 victories was probably the top scoring night fighter Mosquito. *RCAF*

No. 125 Squadron received its first NF.30 in March 1945, NT585 being an example. *Crown Copyright*

February 1945. 125 Squadron had the XVIIs from February 1944, converting to the Mk30 in March 1945.

The Squadrons in 85 Group were advancing further into Europe, building up some impressive scores. Canadian squadrons 409 (Night Hawks) and 410 (Cougars) had each claimed 38 victories between D-Day and the end of November, and 488 was not far behind. The Ardennes attack brought a final period of intense activity, and by the time the advance had been halted, a further 27 enemy aircraft had been claimed despite the bad weather, bringing the total to 227 since D-Day. The Cougars were the top scoring unit, with 46 destroyed.

Towards the end of December 1944, Me262 jet fighters were encountered for the first time, depriving the Mosquito of the overall speed advantage which it had enjoyed for so long. The Me262 would have been in action much earlier had not Hitler insisted that it should be developed as a bomber, instead of its more obvious role as a fighter. It was too underpowered and unreliable to be any use as a bomber, but it would have had enough speed advantage to cause our fighters a great deal of problems.

During March 1945 British airfields became the targets of German bombers, the defending squadrons claiming some victories. The same month Mosquitoes continued on "anti-diver" patrols, fending off more than 6,500 V–1s launched from Holland, the last one falling in Hertfordshire on March 29. The pressure then began to reduce rapidly, random transports being the most common targets, although the slow-flying light communications aircraft proved to be very difficult to detect and hit. The 85 Group's victory tally since March 1944 stood at 299 aircraft, 264 Squadron recording the final claim on April 26.

The wooden aircraft, which many had predicted would be too frail to fly with two powerful Merlin engines had proved its critics wrong. It had defended Britain at night and in bad weather, it had helped to destroy a large proportion of V–1s, and it had carried the offensive right into the heart of Germany, all for a relatively low loss rate.

Although defensive night fighter operations were concentrated in Britain, some operations were also conducted in the Mediterranean on a very small scale. 108 Squadron equipped with NF.XIIs in February 1944, but kept them for only five months. Both 255 and 600 Squadrons flew NF.XIXs and NF.30s from Malta and Italy during the final year of the war.

Mosquito night fighters also had an offensive role to play within No 180 (Bomber Support) Group. Bomber Support, in fact, involved a wide variety of operations such as intruders, rangers and spoof raids by fighter bombers and bombers covered in other chapters. However, the night fighters provided protection for the allied heavy bombers on their night attacks to Germany. These bombers were very vulnerable to enemy night fighter attacks and, without the aid of radar to warn them, stood no chance of defending themselves until it was too late. Night fighter protection was organised by 100 Group on November 8, 1943, under the command of Air Cdre E.B. Addison.

To achieve success on these operations, it was necessary to locate the target aircraft over enemy-held Europe without the aid of home-based radar stations, which were well out of range. A means had to be found to locate the enemy from the air, and one of the earliest methods was to use an aid called "Serrate", which homed on to enemy radio transmissions over ranges up to 161km (100 miles), but this gave only a bearing and not the range. Once the aircraft was close enough the range was established using the MkIV radar. Initial trials with this system were conducted by Beaufighters of 141 Squadron, but they were no longer fast or manoeuvrable enough for the job, so Mosquitoes were allocated.

Three Mosquito B.IVs joined 1474 Flight at Feltwell for "Serrate" trials in November 1942, the unit being numbered 192 Squadron on January 4, 1943. From then on it was allocated to signals work, spying on enemy radio and radar transmissions with the aims of either devising a countermeasure or using them as a means to their own destruction. The training for these demanding duties was protracted, and operations did not start until June 11, 1943, the Mosquitoes sharing their spying duties with more roomy and vulnerable Wellington and Halifax bombers.

Meanwhile, two Mosquito F.IIs had been fitted with rearward-looking radar, so that when a target was located behind it, the Mosquito could sweep round through 360° and attack the enemy from his rear. The Fighter Interception Unit at Ford used these two aircraft on service trials, and 605 Squadron adopted this equipment, known as "Mahmoud", and claimed some reasonable successes. 456 Squadron also flew a few "Mahmoud" patrols from the end of 1943.

The initial period of 100 Group operations was from November 1943 to April 1944, 169 and 239 Squadrons being joined by 141 Squadron on December 4. Following a period of training, the squadrons moved into their East Anglian bases at West Raynham and Little Snoring, where they were issued with some well-used Mosquito MkIIs equipped with the most rudimentary radar in the nose and tail, because the latest radar equipment could not be risked over enemy territory in case it fell into German hands. The crews were somewhat hampered by the poor state of the ancient equipment, but despite this a Bf110 was claimed as damaged on the first 100 Group sortie by 141 Squadron on December 17, 1943. Sorties were flown in the target areas during or after a bomber attack, at known enemy night fighter holding points, or by escorting the bomber stream during the last 64km (40 miles) of the run in to target. All three squadrons soon began to claim victories.

No 515 Squadron joined 100 Group at Little Snoring on February 29th, 1944, replacing its Beaufighters with Mosquitoes. However, as has been recorded in the Fighter Bomber chapter, the Squadron was equipped mainly with MkVI Mosquitoes for low-level intruding operations over enemy night fighter bases without the assistance of radar. They were joined by 23 Squadron in July.

The replacement of the worn MkIIs was commenced in mid 1944, "Serrate"-equipped MkVIs entering service with 169 Squadron on June 18. By the end of July all "Serrate" MkIIs had been replaced by similarly-equipped MkVIs, and 100 Group reached their century with the 100th victim claimed on July 20-21.

The Group was strengthened in May by the addition of 85 and 157 Squadrons at Swannington, both of which re-equipped with Mosquito NF.XIXs. This gave the Group an advanced long-range night fighter with an improved radar capable of locating the enemy more effectively, which was judged a sufficient advantage to justify the risk of losing the aircraft. These aircraft were not fitted with rearward-facing radar, so "Monica I" was fitted, both squadrons using the new equipment to open their scores on June 14-15. Unfortunately both units were transferred to "anti-diver" patrols by the end of the month, leaving the unfortunate bombers to largely fend for themselves, as the V–1 weapon posed a much greater threat to Britain.

The effectiveness of "Serrate" was drastically reduced from August, owing to the German SN2 radar jamming the British AI MkIV, but "Serrate MkIV" was developed by January 1945 to overcome this problem. Another aid, code-named "Perfectos", was developed to home on to the transmissions from enemy Indentification Friend or Foe (IFF) equipment from November 1944, and the Mosquito MkIIs were replaced by AI MkX-equipped Mosquito NF.XIXs, the last MkII patrol being flown by 239 Squadron on October 26-27.

In October trials were undertaken with the America AI MkXV radar known as "ASH", fitted in the nose of Mosquito MkVIs of 23, 141 and 515 Squadrons. 85 and 157 Squadrons had the

**Leavesden built NF.30 NT245 at West Malling, part of II Group on August 12, 1947.**

improved rearward-looking "Monica IV", 85 Squadron had "Perfectos II", 157 Squadron had "Serrate MkIV" and 169 Squadron had "Perfectos" fitted. 169 Squadron had received its first Mosquito XIXs in January 1945.

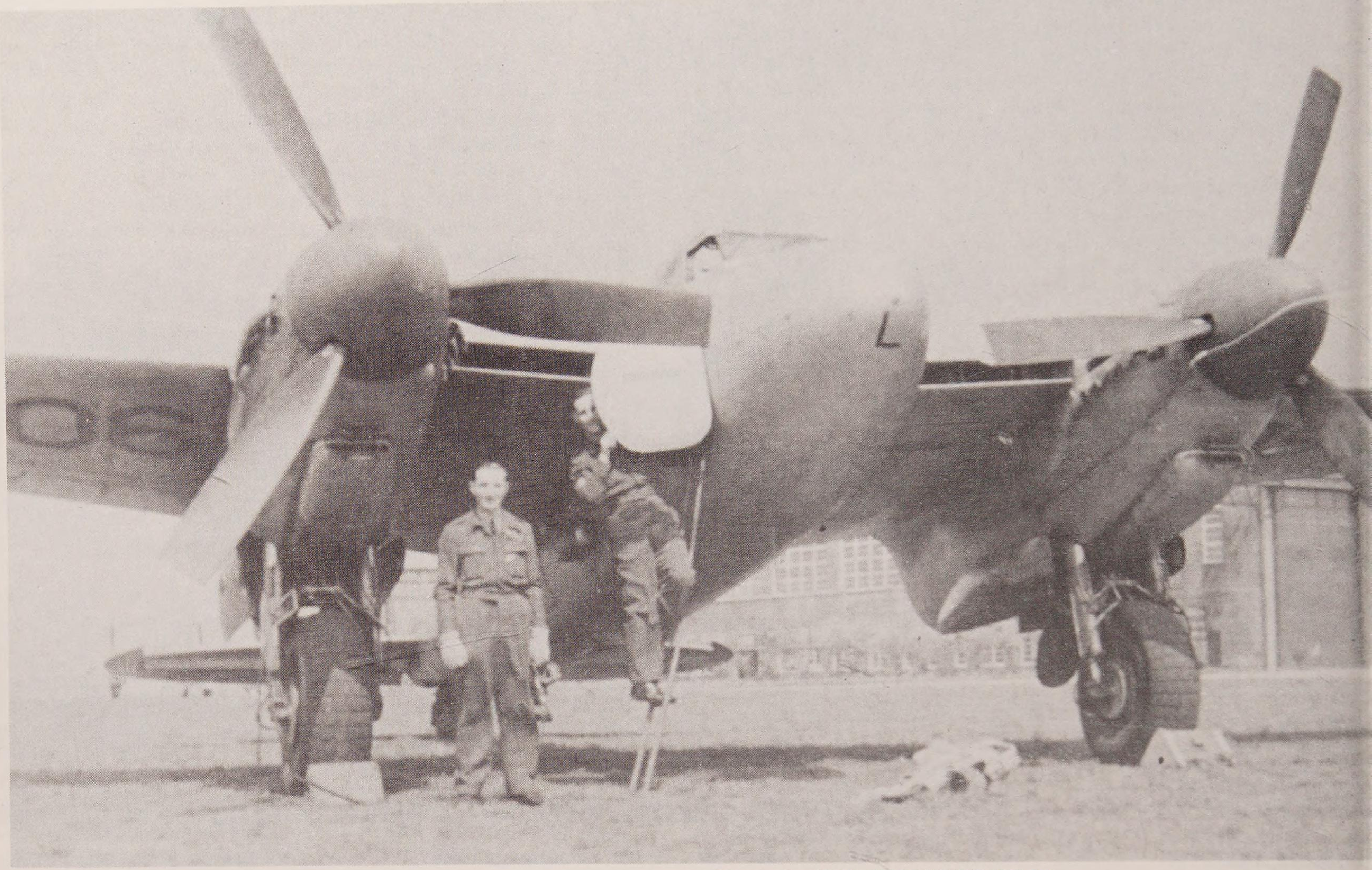
With the reduction of German bombing raids on Britain at the end of 1944, 151, 307 and 406 Squadrons, equipped with Mosquito NF.30s, were transferred from defensive to offensive operations and had "Monica" equipment fitted. No 456 Squadron commenced bomber support duties in March, but with no direct success. On December 21, 141 Squadron was the first unit to use "ASH" on operations, their first victory being a Ju88 claimed on January 1, 1945. This radar required a highly trained and skilled operator to achieve success.

Patrols with NF.30s were commenced by 239 Squadron on January 21-22, their first victim being a Bf110 on February 1-2. Mosquito NF.30s were issued to 141 Squadron during March and early April, with 157 Squadron following close behind. NF.XIXs were retained by 169 Squadron. With the continuing advance into Europe much deeper and longer penetrations could be made, although the opposition was dwindling rapidly, eventually leading to a cessation of 100 Group activities on May 2-3. In 17 months of operation, 249 enemy aircraft had been claimed as shot down, and 18 more destroyed on the ground for the loss of 69 Mosquitoes.

Many of the 27 night fighter squadrons were disbanded between April and September 1945 when the European war came to an end. However, six of the wartime units formed part of the peacetime night fighter defence force, initially with Mosquito NF.30s but later with the NF.36, and 192 Squadron continued as a signals unit. Two night fighter units which did not immediately cease operations were 151 Squadron, based at Weston Zoyland until disbandment on October 10, 1946 and 307 (Polish) Squadron, which remained in Fighter Command until disbandment at Horsham St Faith on January 2, 1947.

The permanent peacetime night fighter squadrons tended to be based at two main airfields: West Malling in Kent, as part of what was 11 Group, and Coltishall near Norwich, in what was 12 Group. The 11 Group units were 25, 29 and 85 Squadrons, and the remainder were 23, 141 and 264 Squadrons. 23 Squadron reformed in Fighter Command at Wittering on September 11, 1946, before moving to Coltishall the following February. 141 Squadron reformed at Coltishall on June 17, 1946, with the ultimate RAF Mosquito, the NF.36, and on November 20 264 Squadron was reformed with the same mark of Mosquito at Church Fenton, returning to Coltishall in September 1950. 264 Squadron went to Acklington in Northumberland after a stay at Church Fenton, returning to this base before moving to Linton-on-Ouse. When repairs were made to Linton's runway, 264 Squadron moved to Leuchars and converted to Meteor NF.11s.

One of the sergeant pilots in the post-war night fighter force was Don Mortimer. He had trained on Harvards and Oxfords before arriving at 204 Advanced Flying School (AFS) Driffield, making his first Mosquito flight in T.III RR288 on May 18, 1948. He found this version very lively with ample power and a marvellous aircraft to fly. After 7-8hr flying, including only one single-engine check, he was sent solo and then moved on to 228 OCU at Leeming, where he was introduced to the NF.36 on a single flight with a Squadron Commander and then sent solo in this much heavier, fully-equipped aircraft. The four pilots on the course then met four navigators in the bar and decided how they should pair up. The crew had to work closely together, so it was essential that they should get on well. At the OCU their task was to learn how to operate the Mosquito NF.36



**Mosquito T.III of 204 AFS Driffield.**

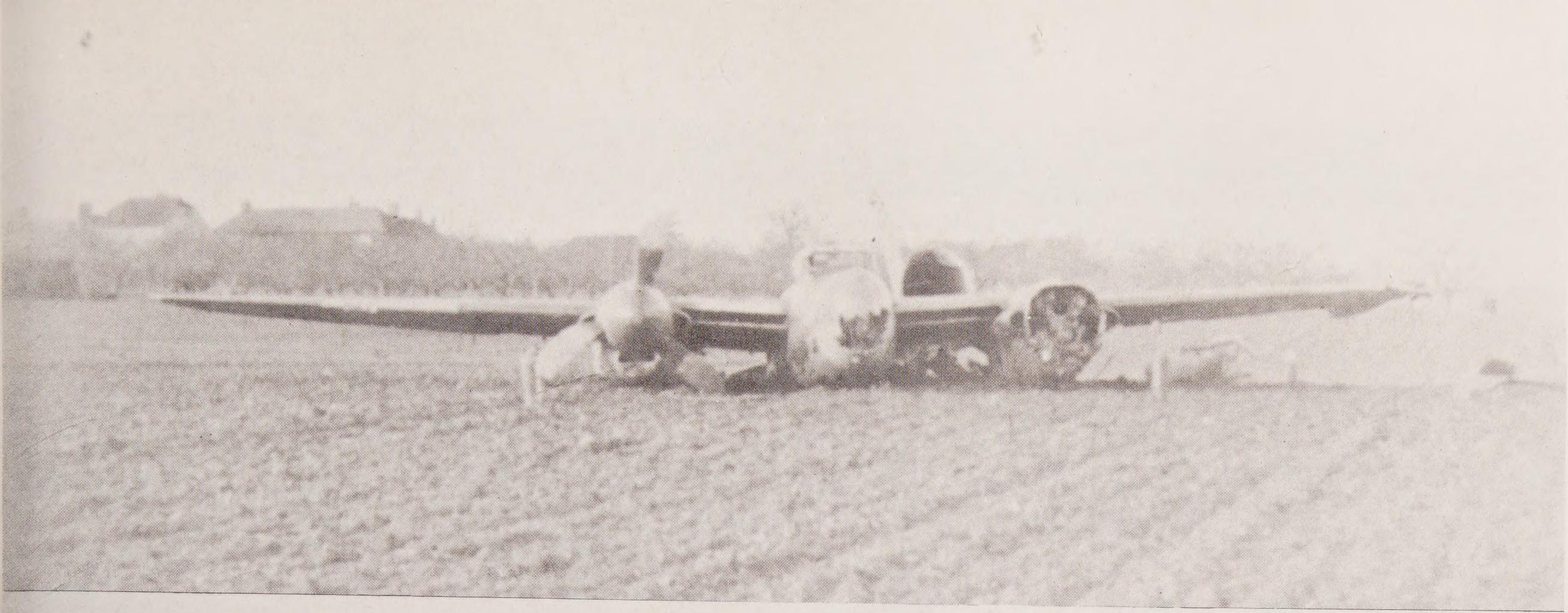
in all weathers and at night. The aircraft was usually flown during the day to check that everything was in order, especially the American AI.X which was later used in the Meteor NF.11 and, following some sleep for the crew, the aircraft would be flown on two night sorties, lasting 4-5hr overall. When this course was successfully completed, Don and his navigator joined 29 Squadron at West Malling in September 1948. Early in 1949 an Instrument Rating (IR) system was introduced for the first time, flown in T.IIIs with screened cockpits. The aircraft was more responsive than the NF.36, making it more difficult to fly steadily. The result of this IR test was to gain white, green or master green cards, depending upon experience and skill.

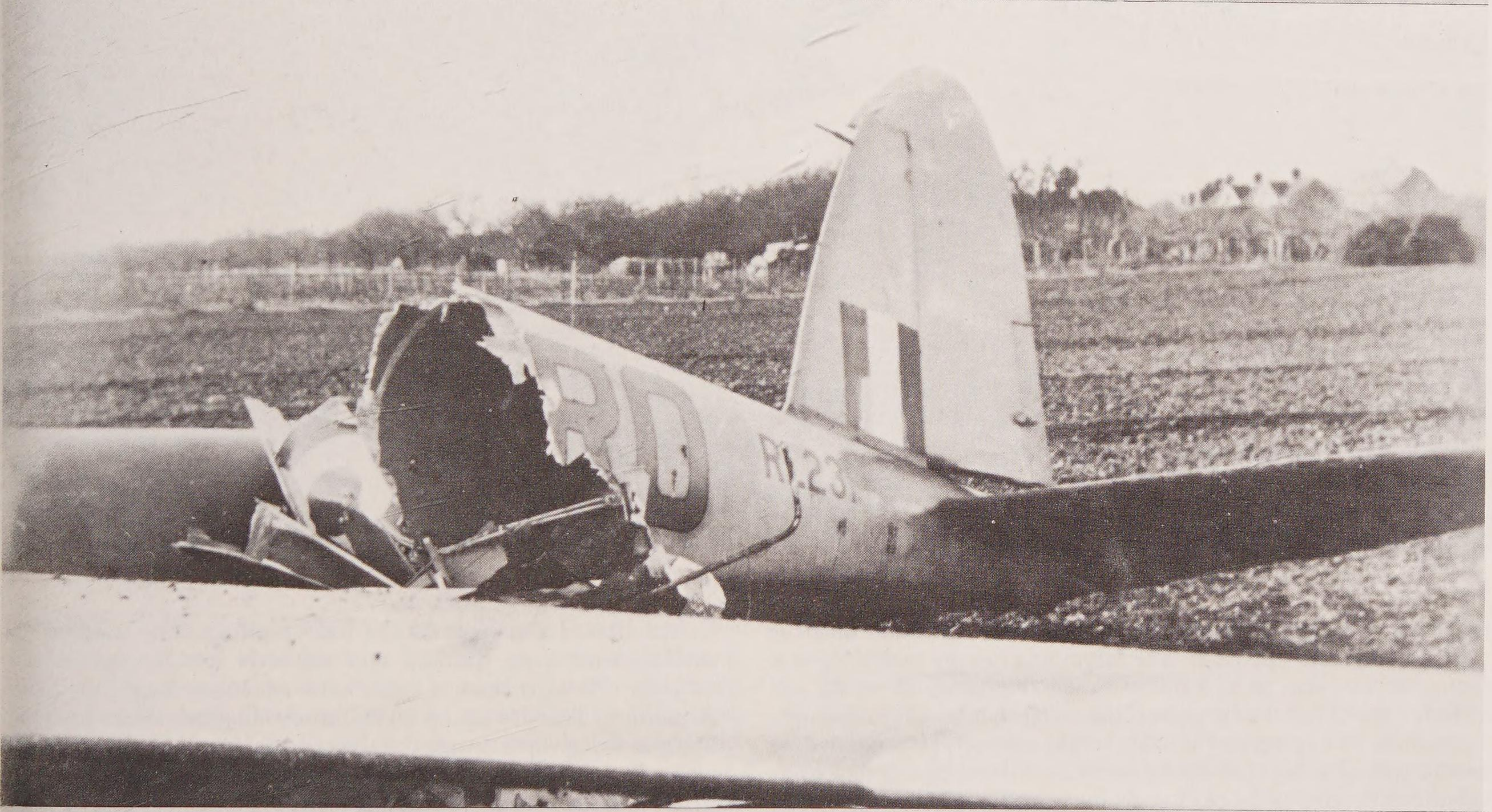
In February 1949 Don had an accident in a Mosquito NF.36 when the port engine failed on take off, the drill being to abandon take off. He managed to get the tail back down on to the runway so that the brakes could be applied, but the boundary fence was approaching rapidly and the practice was to pull up the undercarriage. The rotating propellers were a hazard, as they had been known to come through the cockpit sides, but on this occasion all went well; the aircraft went through the fence into a ploughed field and broke up, absorbing the shock. Both crew were safe in the cockpit and climbed out of the top hatch, but the aircraft was a write-off. The difficulty with the NF.36 was that the safety speed of 315km/hr (170kt) for a single-engine climb was higher than the climbing speed of 287km/hr (155kt). Therefore, if an engine failed at any stage during the climb, the nose would have to be lowered to maintain flying speed.

Normal peacetime operations consisted of practice interceptions, a pair of Mosquitoes taking turns at being target and attacker. The attacker was guided by a Ground Controlled Interception (GCI)

*Opposite.* **The wreckage of NF.36 RL231 in which Don Mortimer crashed at West Malling with No. 29 Squadron on February 8, 194 following engine failure.**

**T.III VA893 of No. 29 Squadron with left to right, the CO Squadron Leader Mike Shaw, Fl Lt Wakeford and the ground crew NCO. The No. 29 Squadron badge is on the fin.**

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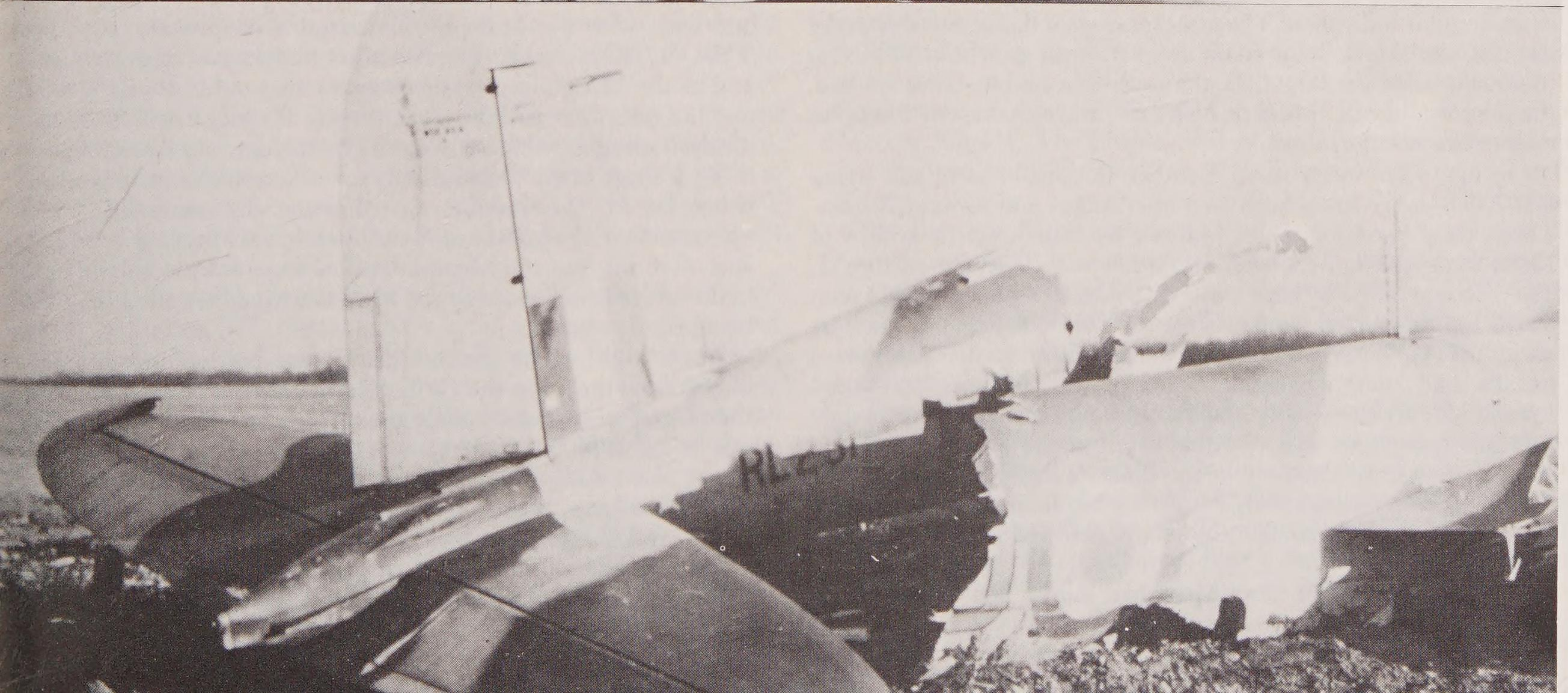


unit which was often mobile, starting at 32km (20 mile) range at various angles of approach. The target was usually picked up at a range of 13-14km (8 to 9 miles), when the navigator would call "Judy" to indicate to the ground controller that he was taking over guidance. The target and attacker would normally be separated by an altitude of 305m (1,000ft) for safety until the navigator took over, giving directions by the clock code, range and height above or below in an angular indication. The attacker carried lights, but the target did not, the attack being made from the rear to within 180-245m (6-800ft), when the target should have been visible. Once spotted, the pilot would call "Murder, Murder", and then he would take his turn to become the target.

On one night every week, Bomber Command were still flying 600-700 bomber formations over the ranges and around Britain. These were used for target practice by individual or groups of Mosquito night fighters, who would follow their leader on the AI. There would probably be at least half a dozen contacts on the screen in the tightly-packed bomber streams, collisions being avoided by use of the AI. While the bombers were in darkness the Mosquitoes usually had their navigation lights on, so the bombers would sometimes corkscrew to try and confuse the attackers. Not only was this dangerous in a crowded sky, but the Mosquitoes could easily follow until the crew of the bomber had had enough. The Mosquito crews occasionally flew in the big bombers to experience the other side of the conflict, but they preferred to stay with their own aircraft.

In November 1950 Don Mortimer joined 264 Squadron at Coltishall and was commissioned as an officer. The training w similar, with high, medium and low-level intruder sorties ov airfields. Perhaps twice a year, each squadron would go to t Armament Practice Camp (APC) at Acklington, where air-to-a live gun firing was attempted on towed sleeve targets. These targ were dimly illuminated by battery-powered lights and towed Miles Martinets over the sea. Normally the banner would be tow one way, with the Mosquito flying on a reciprocal course abo 305m (1,000ft) above. The Martinet had its navigation lights o and as the Mosquito pilot flew abeam, he would turn in at 90° a use the Martinet as his target, letting the sight drift back to t dimly-lit drogue, which could only be seen at very short range, a firing a short burst. Without any external references, and with t usual lag of the vacuum instruments, disorientation was n uncommon in the pull-back to the "perch". Surprisingly, the drog was often hit, but the Mosquito pilots were not too happy and t night target firing was stopped when the Martinet pilots objected being used as targets.

Then night air-to-ground firing was carried out against illuminated target on the Holbeach ranges. The drill was to dive the target, which was usually the only external reference, and p out at 183m (600ft), but this was often lower due to altimeter l There was a danger of damage from ricochetting shells as the tar was flown over. These exercises were not enjoyed much by crews, and did not appear to be of much value.

During the winter of 1948-1949 the cold war warmed somewhat when the Allies had to begin the Berlin airlift. T

**NF.38 VT659 at Hatfield on December 24, 1948 being driven by Father Christmas. This version did not enter RAF service, but a number were sold to Yugoslavia.**

Mosquito night fighters were put on full alert, armed with live ammunition, and scrambled to identify any mystery aircraft approaching Britain, the likely target being the Russian-built B–29 Superfortress copy. Confusion could be expected in identification, as both the RAF and USAF used the same aircraft, but Don was told he would be instructed what to do when the time came.

At about this time, Don Mortimer was scrambled one night to intercept an unidentified target flying off the French coast up the Channel. The Mosquito was being vectored by the GCI on the Isle of Wight, and just as it passed out of range of RT contact, the target was picked up by the AI. The first interception attempt was too fast, and despite throttling back in fine pitch with the radiator flaps open, they overshot underneath. Don turned away and returned again to identify the mystery aircraft. It was not too dark, so Don was able to recognise the unlit, all-black aircraft as a Lancaster bomber without any identity or national markings.

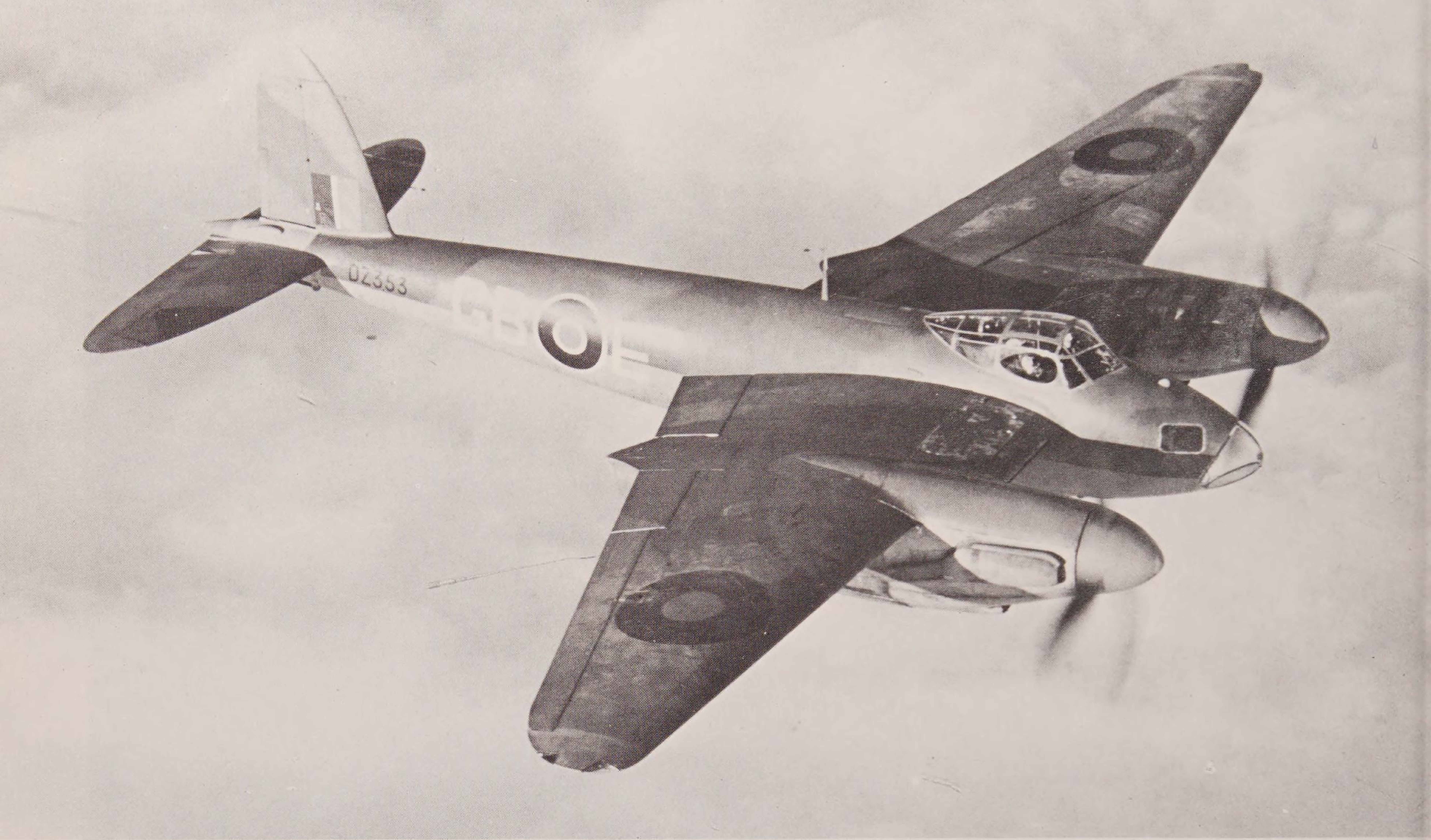
Don followed this Lancaster at 6,400m (21,000ft) as far as Dover, when, regaining RT contact, he alerted his base and obtained instructions. As the Lancaster flew on, Don flew from side to side, describing it over the RT, but its crew gave no indication of recognition, or of even having seen the Mosquito. After about ten minutes Don broke away and returned to West Malling, where he de-briefed after his strange experience. Some time later he was told that a likely explanation was that the Lancaster was being operated by a Russian crew on an intelligence-gathering flight from East Germany. The aircraft was probably one of the ex-RAF, wartime aircraft which had flown over East Germany on long missions and, being unable to return to base, had carried on to Russia, where they were left.

Don also remembers the Canberra being evaluated as a night fighter, but rather surprisingly it was rejected due to criticism of its manoeuvrability, the rather less satisfactory line of Meteors, Vampires and Javelins being adopted instead. The Canberra really should have been the logical choice for a Mosquito Night Fighter replacement.

The 11 Group Squadrons all started with the Mosquito NF.30, converting to the NF.36 from September 1946, although 29 Squadron also flew NF.30s again in late 1950 while converting to Meteor NF.11s. The phasing out of the Mosquito night fighters commenced with 29 Squadron, which became the first jet night fighter unit when it re-equipped with Meteor NF.11s in October 1950. Between September and December 1951, 85, 141 and 264 Squadrons similarly re-equipped, leaving 25 and 23 Squadrons to re-equip with Vampire NF.10s in July and October 1951 respectively. 23 Squadron was the last Mosquito Night Fighter Squadron in the RAF, the last NF.36 being retired in May 1952 prior to being scrapped.

The life of the Mosquito night fighters spanned eleven busy years. The basic airframe changed little, but it was powered by progressively more powerful Merlin engines and equipped with increasingly more sophisticated AI radar equipment. The Mosquito made a major contribution to winning the war, and also helped in the uneasy peace that followed, before the more modern jets came into service.

# MOSQUITO BOMBER OPERATIONS



**Mosquito B.MkIV DZ353 GB-E of No. 105 Squadron, the first bomber squadron to be equipped with Mosquitoes.** *Flight*

The Mosquito was conceived as a high speed, unarmed bomber, but even from the earliest days its potential in other important roles, such as photo-reconnaissance and night-fighting, was realised. Photo-reconnaissance duties proved the aircraft in the high speed, unarmed role, demonstrating its relative immunity to enemy fighters. If the enemy was fortunate enough to catch a Mosquito, its rugged structure was well able to absorb all but the heaviest damage.

The unit chosen to introduce the Mosquito bomber into active service was 105 Squadron, based at Swanton Morley, whose Commanding Officer was Wg Cdr Peter Simmonds. Geoffrey de Havilland Jnr delivered the first aircraft, W4064, to Swanton Morley on November 15, 1941, announcing his arrival by un-bomber-like aerobatics and high-speed fly pasts.

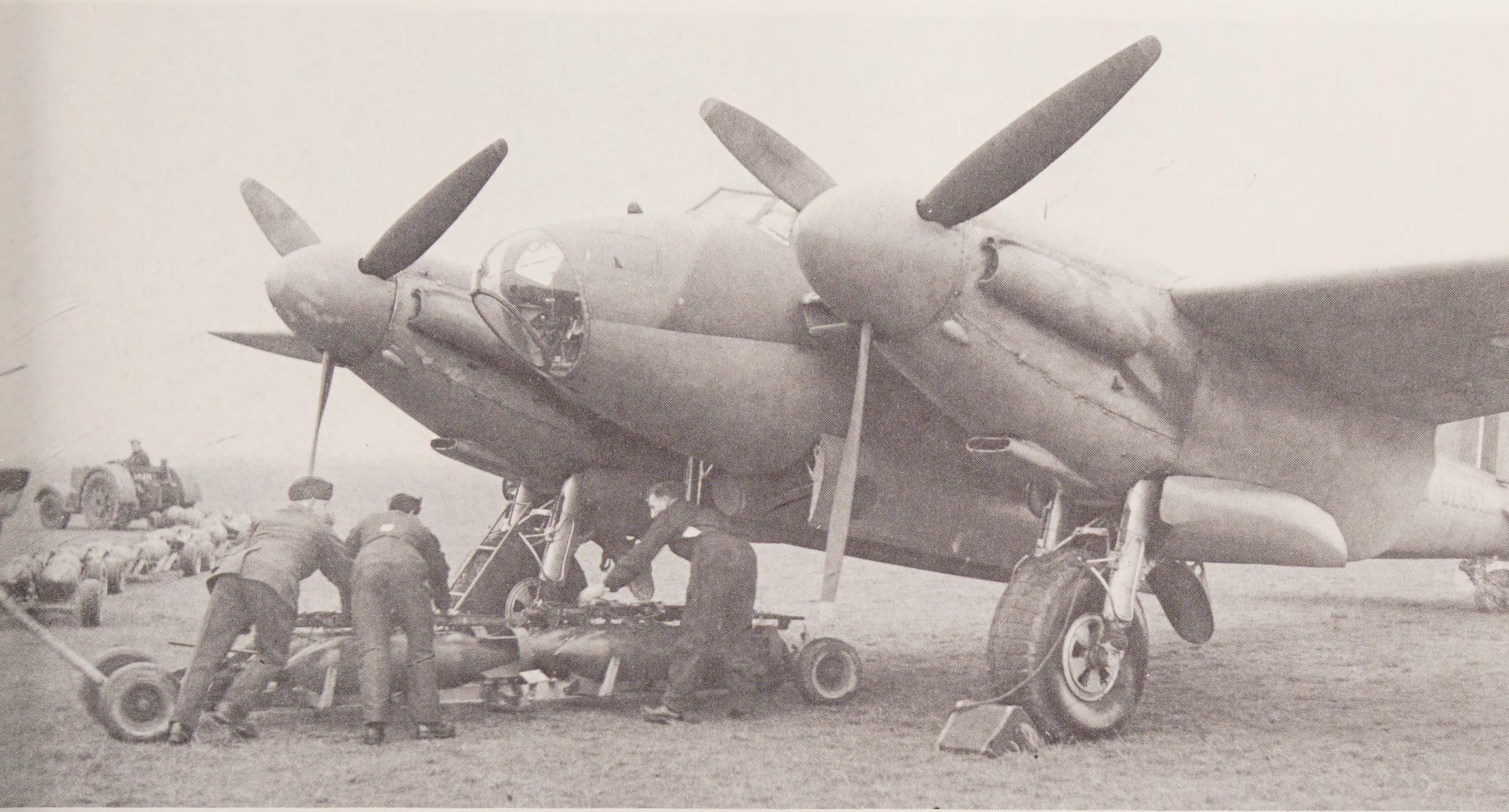
One of the pilots with the squadron at this time was George Parry, who had completed two tours on Blenheims. George joined the squadron as a Flight Lieutenant, and soon went to Boscombe Down to fly some of the early bombers and assist in the development programme. His first meeting with a Mosquito came when one was pointed out to him on the airfield. He walked out to the aircraft, climbed in, looked around, started up, taxied out and took off. After some flying at Boscombe, George returned to his Squadron and helped compile the early version of the pilots' notes.

However, the squadron's initial enthusiasm on receiving their first aircraft was followed by disappointment when the first machine developed hydraulic leaks and had to be returned to Hatfield for adjustments the day after its delivery. But on November 17 W4066 arrived and commenced the build-up of the squadron, whose tas was to test the effectiveness of high speed as a means of evadin enemy fighters. Planned operations included a number of dayligh attacks on heavily-defended targets.

At the end of November 105 Squadron moved to Horsham S Faith at Norwich, the crews not only learning to handle th Mosquito, but also to fly it operationally. There was no forma training unit, the new pilots having an hour's flying in the aircraf with a check out pilot and then going solo. The pilots had to chec fuel consumption under normal operating conditions, make high altitude flights and fly at high speed over long distances. Both hig and low-level practice bombing sorties were included, as well a mock combat with a Spitfire, which was considered to be out performed.

By mid-May 1942, seven Mosquitoes MkIs, mostly with the shor engine nacelles, and one MkIV had been delivered to the squadron but Bomber Command was sceptical of its success and reluctant t risk the aircraft and crews, despite the crews' natural eagerness t get started. By the end of May eight Mosquito B.IVs were o strength, and the first active operation was flown on May 31 by tw aircraft which flew to Cologne to add confusion to the previou night's "Thousand Bomber" raid. They dropped two 500lb and tw 250lb bombs, but one of the aircraft failed to return and no trace of i was found, despite a search.

A number of these early flights were purely photo reconnaissanc missions to record the damage caused by the main bomber force th night before and deliver the results quickly to Bomber Comman On these occasions bombs were not normally carried. The followed weather reporting flights, when bombs were carried an



*Above.* **B.MkIV DZ367 GB-J of No. 105 Squadron being loaded up ready for another sortie. The forward end of the bomb doors have camera hatches to record the damage.** *Flight*

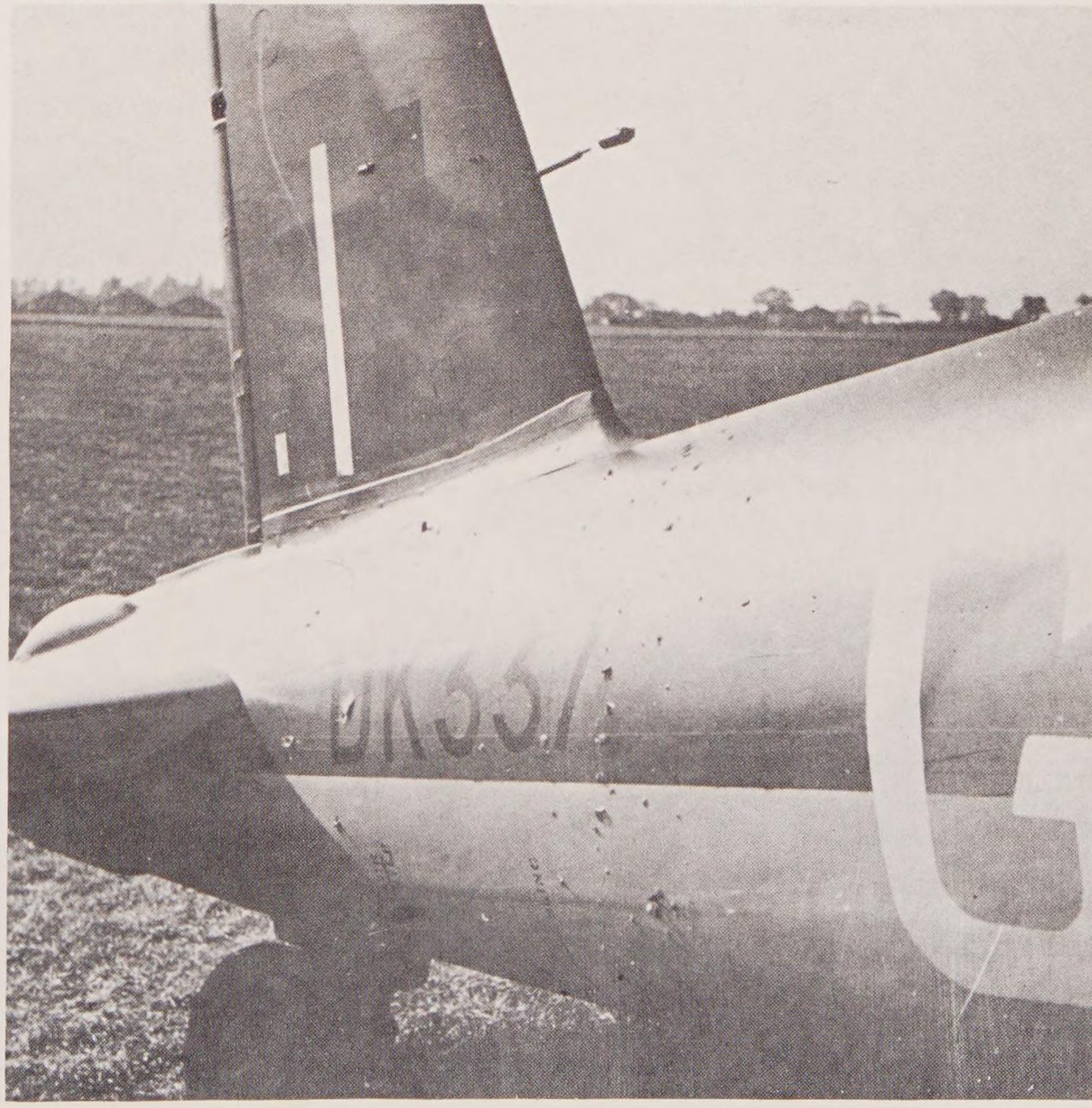
the Mosquitoes would help establish the expected weather for the coming night raid. They would then fly out at dusk on a short trip without bombs, to confirm the early part of the route weather for the bomber stream. The initial plan had been to bomb from high altitude, but this soon changed to low-level precision attacks in many ways similar to those by the fighter bombers, but without the guns to keep the enemy's head down.

The second squadron to form was 139, which joined 105 squadron at Horsham St Faith on June 8, 1942, sharing aircraft until the end of the year. On July 2 the submarine yards at Flensburg were attacked and the Mosquitoes were intercepted by FW.190s for the first time. Unfortunately two Mosquitoes were lost, but two others managed to escape by using full boost power and pulling away from the enemy fighters. Although it was possible to escape from the FW.190, it was a difficult adversary, giving no cause for complacency. As a result of these experiences it was decided to operate the Mosquito bombers at high level on clear days and at lower levels if cloud cover was available.

The start of a day's work would be an early morning briefing on the targets, expected weather, defences, etc. The crews then chose their target out of those available, the decision usually depending upon the weather. The ground crews would then be advised to prepare the aircraft with the requisite fuel and bomb load ready for an afternoon take off, the plan being to reach the target at dusk and return home when the enemy defences had been alerted, under cover of darkness. The aircraft usually operated in groups of four or six, unless a group of targets were to be attacked, when up to 12 aircraft could be involved, splitting up near the target area. It was common practice to select a spoof near the intended target to confuse the enemy, and make a last-minute turn for the planned target.

The pilot normally kept a lookout for hazards in the forward 180°, while the navigator covered the rear. On low level raids obstructions were a hazard, and one pilot, named Rowlands, collected a Danish

*Below.* **Light flak damage to No. 105 Squadron Mk.IV DK337 on return to Horsham St. Faith on September 22, 1942.**



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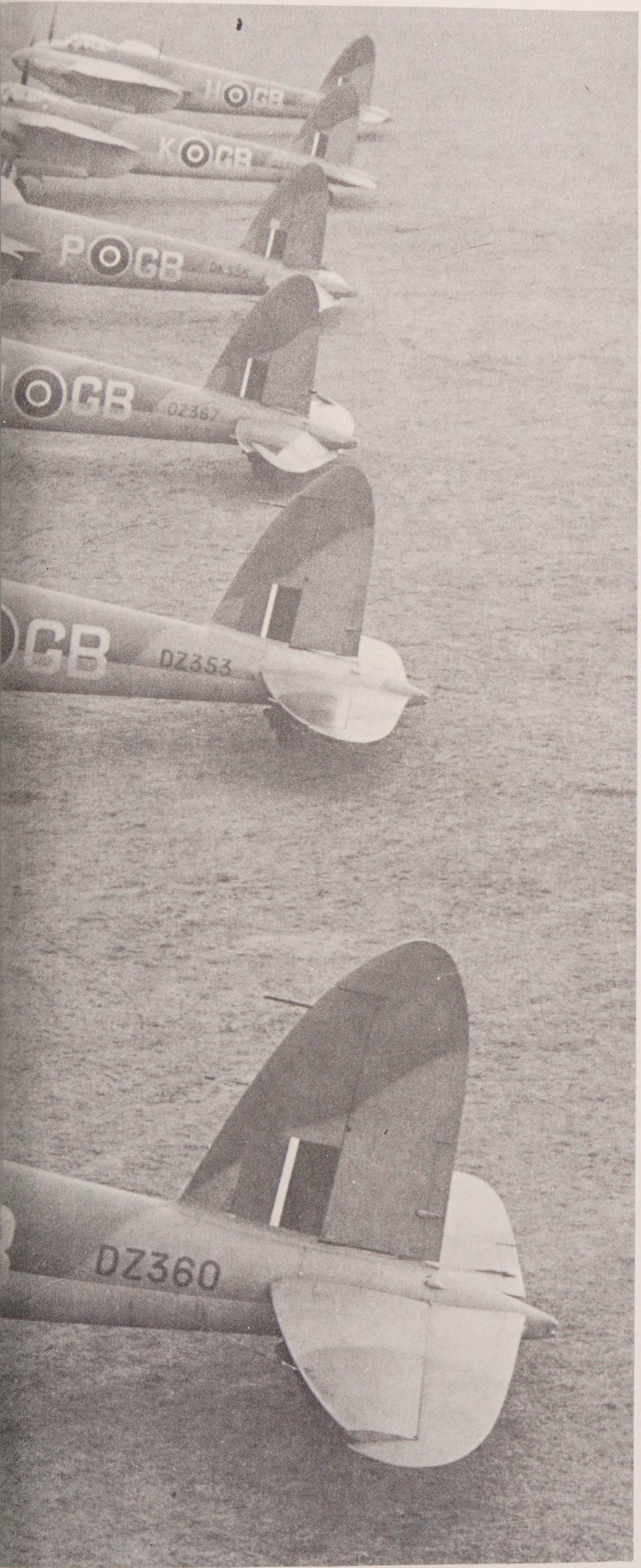

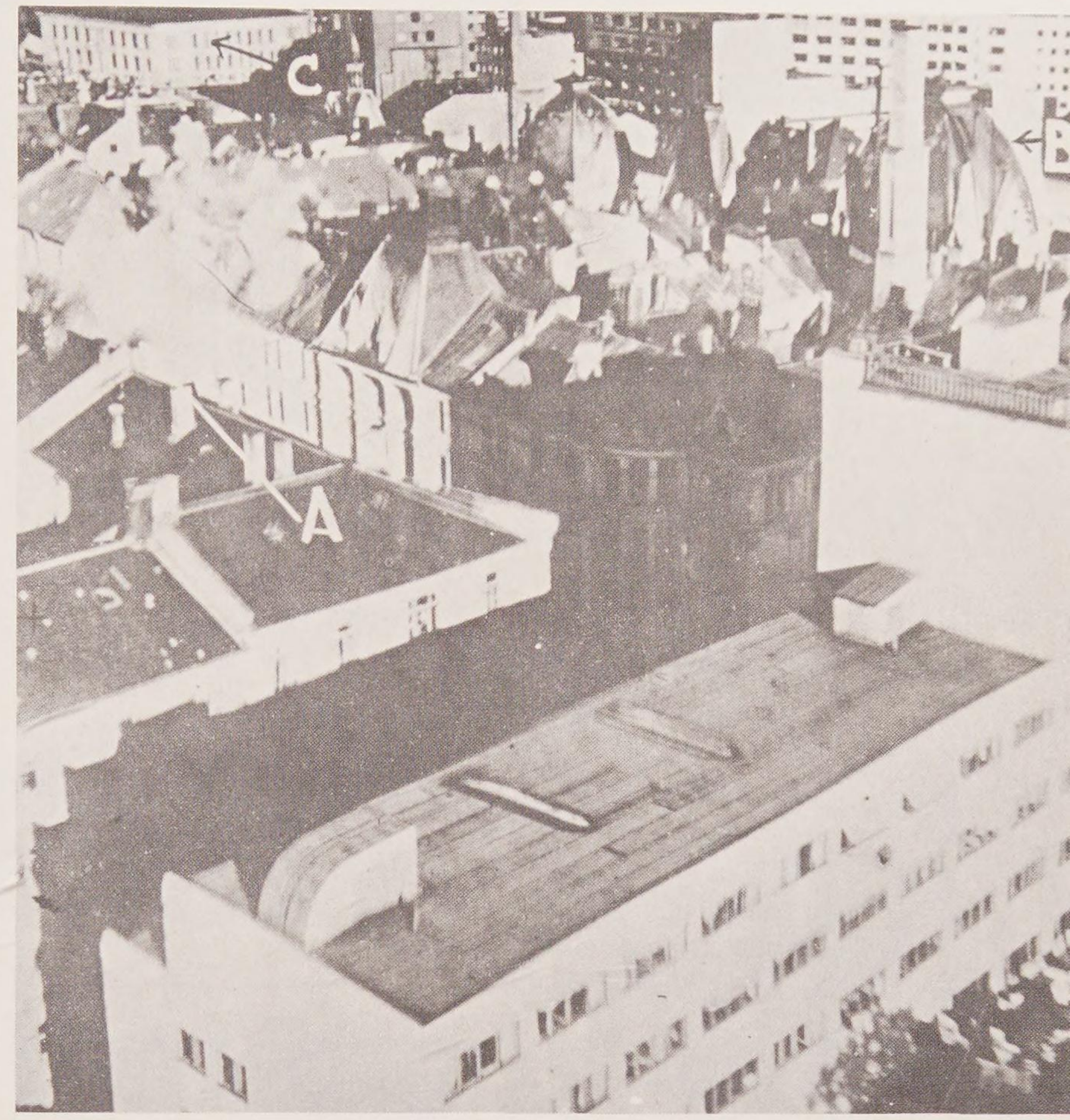

*Above.* **Direct hit 'A' on the Victoria Terrasse of the Gestapo HQ in Oslo by a delayed action bomb from No. 105 Squadron on September 25, 1942, taken from the leading aircraft.** *IWM*

*Left.* **Mosquito Mk.IVs of No. 105 Squadron with engines running at Marham in December 1942.** *Charles E. Brown*

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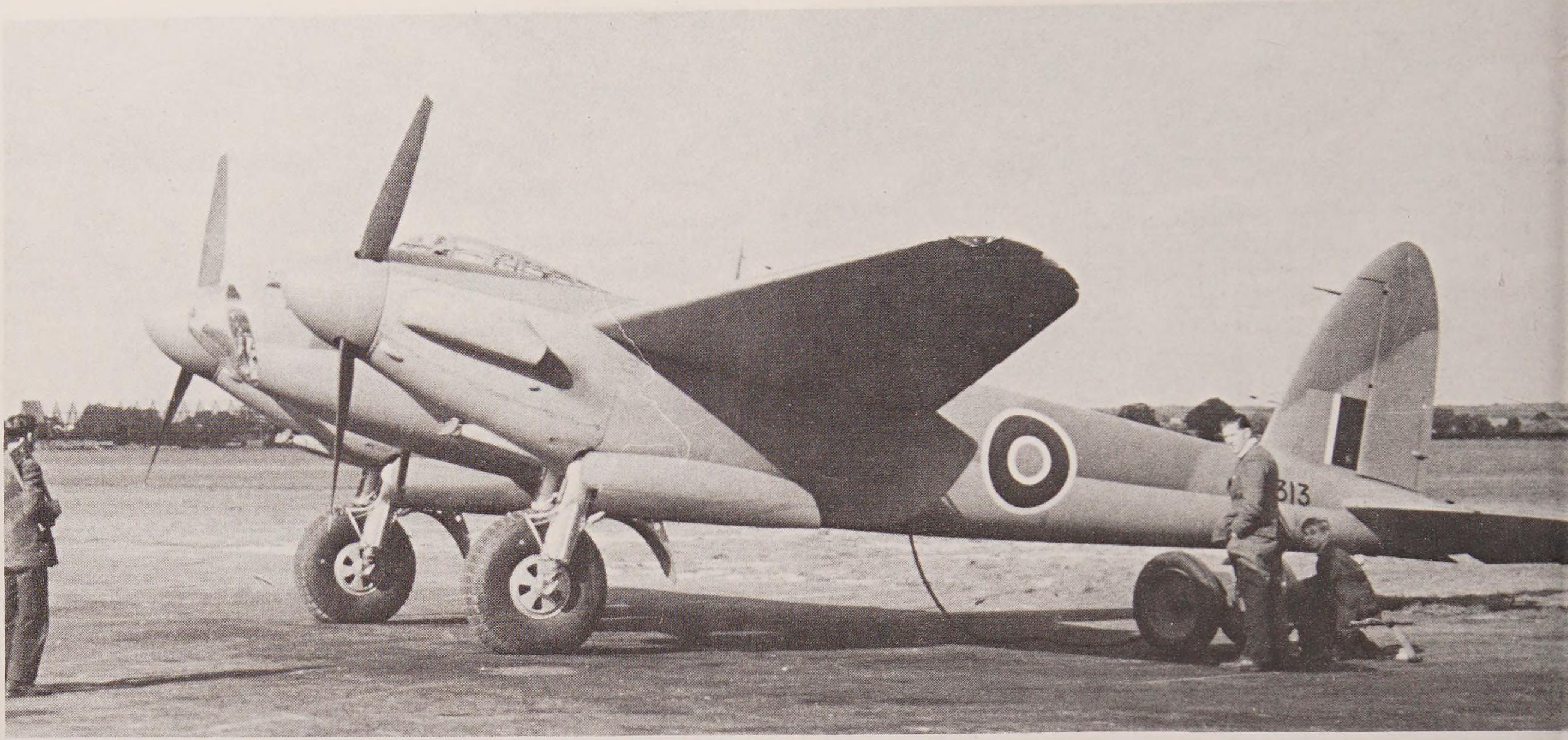
chimney pot through the nose of the aircraft he had borrowed from George Parry. Although the port engine was running roughly as a result, the aircraft was flown home safely and repaired. After initial problems with the repair of Mosquitoes, experience proved that this was fairly simple. For example, damaged wingtips were repaired simply by cutting off the damaged section and butt-jointing on a new one.

On September 17, 1942, the first bombing attack of the war on Berlin was attempted, using six Mosquitoes from Horsham St Faith. The raid was made at high level during daylight, but cloud obscured both the target and its alternative, Hamburg. Because of the cloud cover the results were unconfirmed, and one Mosquito failed to return.

On September 25, the 22nd birthday of the de Havilland Company, four Mosquitoes, led by George Parry, left Leuchars, in Scotland, for the first of the daring low-level daylight precision raids. The target was the Gestapo Headquarters in Oslo, the aim of the raid being to destroy the records and boost the morale of the Norwegians in their enemy-occupied country. The briefing of the crews for the raid was done largely from photographs which George Parry had to collect from Stockholm. He was, therefore, the first pilot to take a Mosquito to Sweden, a preliminary to the later BOAC service using civilian-registered aircraft and airline crews. His aircraft was painted grey overall and all military markings were removed. George Parry flew from Horsham St Faith up to Leuchars and then out across the North Sea, landing at Stockholm just ahead of a German official visit in a Ju52/3m. He was directed to an isolated apron, where he had to wait some time for the British Embassy staff to contact him, as they were unaware of his arrival.



**Mosquito B.IV DZ313 at Hatfield ready for delivery.**

The Gestapo HQ in Victoria Terrasse was a large structure with a number of domes which stood out well from the closely-packed surrounding buildings. It had been built in 1899, and was a maze of long dark corridors with many cell-like rooms; the cold, dark cellars were used for torture, and agonised screams could not be heard outside. This was to be the first of a number of attacks on Gestapo Headquarters in occupied Europe, the Mosquito being the ideal aircraft to deal with these targets.

At 14.00hr on September 25 the crews were ready to go, and each aircraft was loaded with a pair of 453.5kg (1,000lb) bombs. Squadron Leader Parry, with his navigator, Plt Off Robson led the raid in DK296 "G" with Plt Off Rowlands and Plt Off Reilly in DK313 "U" making up the leading pair. The second pair consisted of DK328 "V" crewed by Flg Off Bristow and Plt Off Marshall, and DK352 "S", flown by Flt Sgt Carter and Sgt Young. They flew up the Skagerrak at low level, and, as they passed the mouth of the inner Oslo Fjord at Drobak, dropped down to the attack height of 30.4m (100ft), roaring straight at the target across the Oslo rooftops.

Coincidentally, the Norwegian Nazis, headed by Minister-President Quisling, had arranged a major convention on the day of the attack, and fighter protection had been requested in the Oslo area. Four FW190s were therefore stationed temporarily at Fornebu, where all appeared quiet and peaceful. The German pilots did not expect any action, and were somewhat surprised to be scrambled two hours after arrival when the four Mosquitoes were spotted approaching the coast. Only two out of the four fighters were sent up, owing to a lack of electrical starters, and they spotted the approaching aircraft as they came up the Fjord. The Mosquitoes were within range over the city centre, but by then all four aircraft had dropped their bombs. George Parry remembers seeing hits on surrounding buildings, and he believes his bombs went right through Victoria Terrasse.

The two FW190s selected a Mosquito apiece, but were only able to get in a quick burst due to the bombers' high speed. A number of shells hit Plt Off Rowlands' aircraft without causing serious damage (after the war the British pilot and his adversary were to meet each other in a more cordial atmosphere), but Flt Sgt Carter's aircraft was more seriously hit, the starboard engine catching fire. Carter radioed his colleagues that he would try to reach Sweden, but he los height, sliced through some birch trees, and crashed into Lak Engervann to the west of Oslo. Two Norwegians rowed out to pic up the crew, who had been thrown clear, but despite their speed action both the pilot and navigator were dead.

The other three aircraft returned via Sumburgh in the Shetland after flying for nearly five hours over a distance of 1,770km (1,10 miles), with adequate fuel left in their tanks. From this experienc an operational low-level range of 1,448km (900 miles) was established, and a figure of 2,172.5km (1,350 miles) at high level.

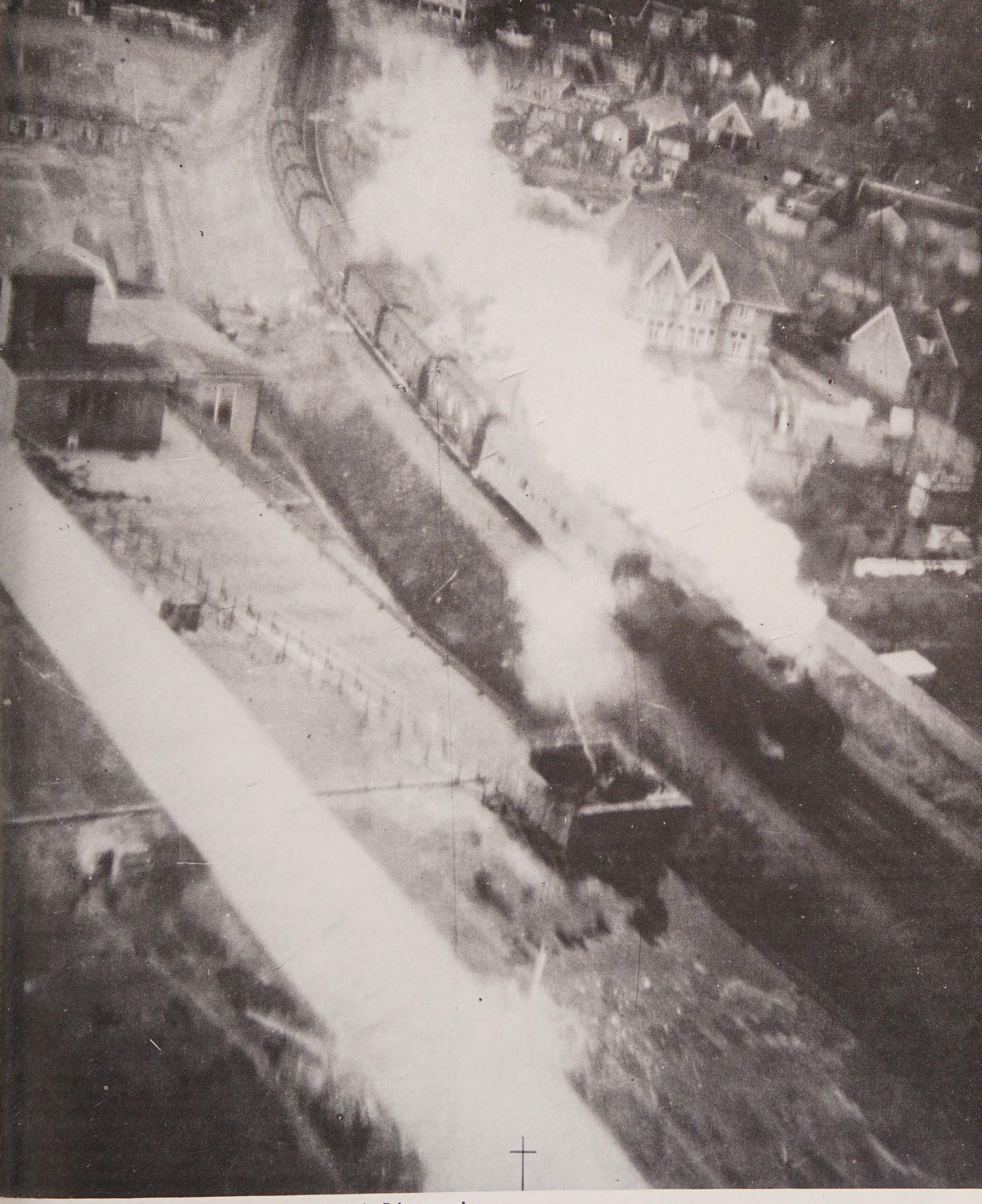
Following the raid, it was found that five different building around the target had been hit, killing eight Norwegians an injuring 67. German losses were unknown, and the interrogatio and torture of Norwegian citizens carried on largely uninterrupte in Victoria Terrasse. A second raid was therefore planned for 12 t 18 months ahead.

Up to this time, the existence of the Mosquito had been kep secret from the British public, but the day after the Oslo raid a announcement about the raid and the aircraft was made on the BB News in London.

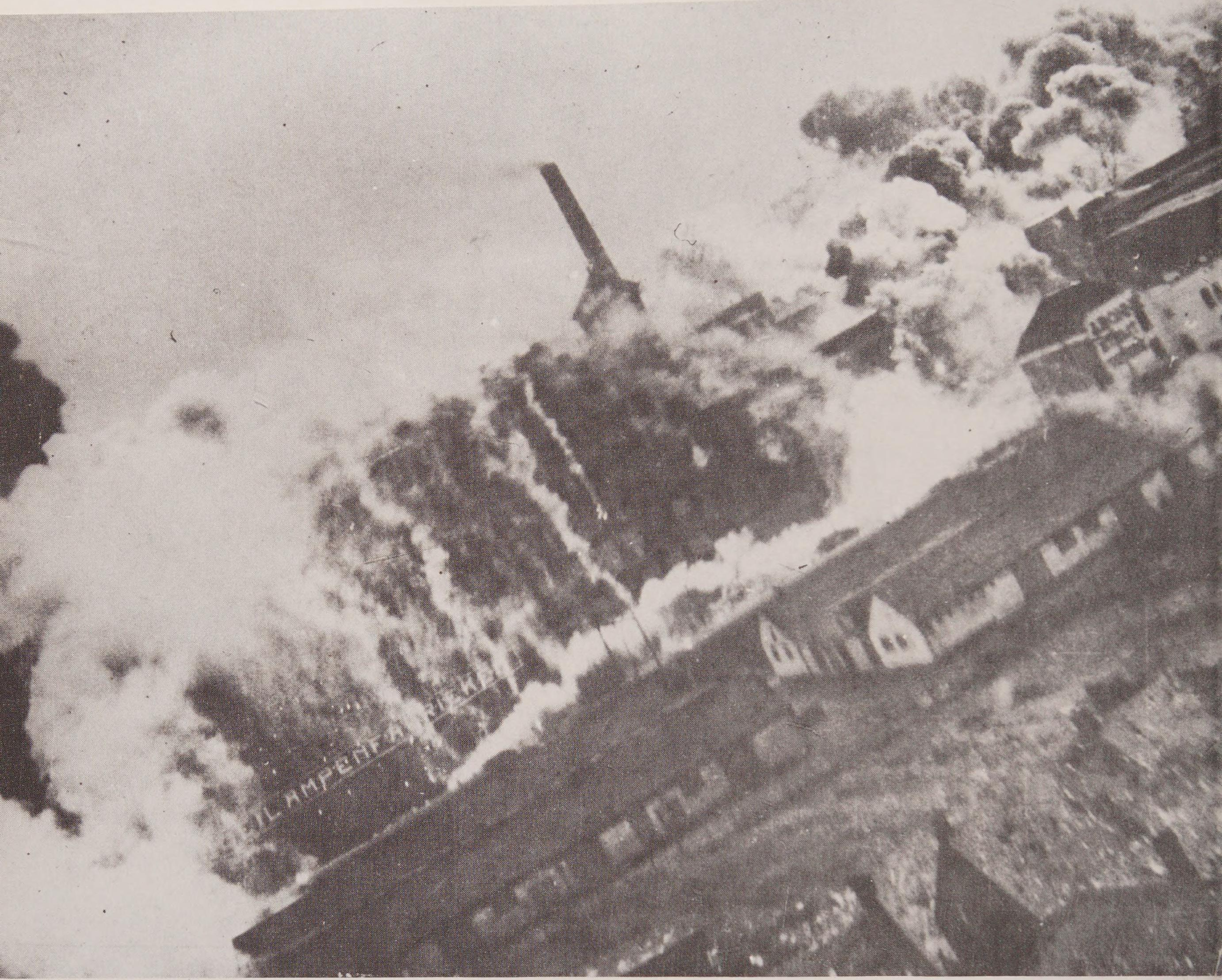
By the end of September 105 Squadron had 19 Mosquitoes o strength and was trying various ways of raising the top speed Attention to detail design and the smooth finish was already good so polishing added only about 5mph. A greater increase wa achieved by replacing the shrouded exhausts with oval-ended stubs which gave an improvement of 10-13mph. Defensive armament wa still being considered, proposals including fixed or remote-controlled rearward-facing guns in the tail, engine nacelles o canopy. However, the performance improvements reduced the ris of attack and once again the idea was dropped.

In September 1942 109 Squadron at Wyton, near Huntingdon were re-equipping with Mosquitoes and 139 Squadron moved t Marham. The equipping of the bomber squadrons was still slo owing to priority being given to the fighter squadrons.

Low-level flying was not without risk. There were spectacula bird strikes, and some aircraft hit the water while flying low over calm sea when height became difficult to judge. Despite some losse of lives and aircraft, the Mosquito demonstrated a relativ immunity during the development of attack techniques in 1942. I was proved possible to fly low in daylight in an unarmed bombe



**A Mosquito attack on Hengelo in Holland with a train, flak gun, and bombs going through the factory roof.** *IWM*



**Nos. 139 and 105 Squadrons attack on the Philips Works at Eindhoven on December 6, 1942.** ***IWM***

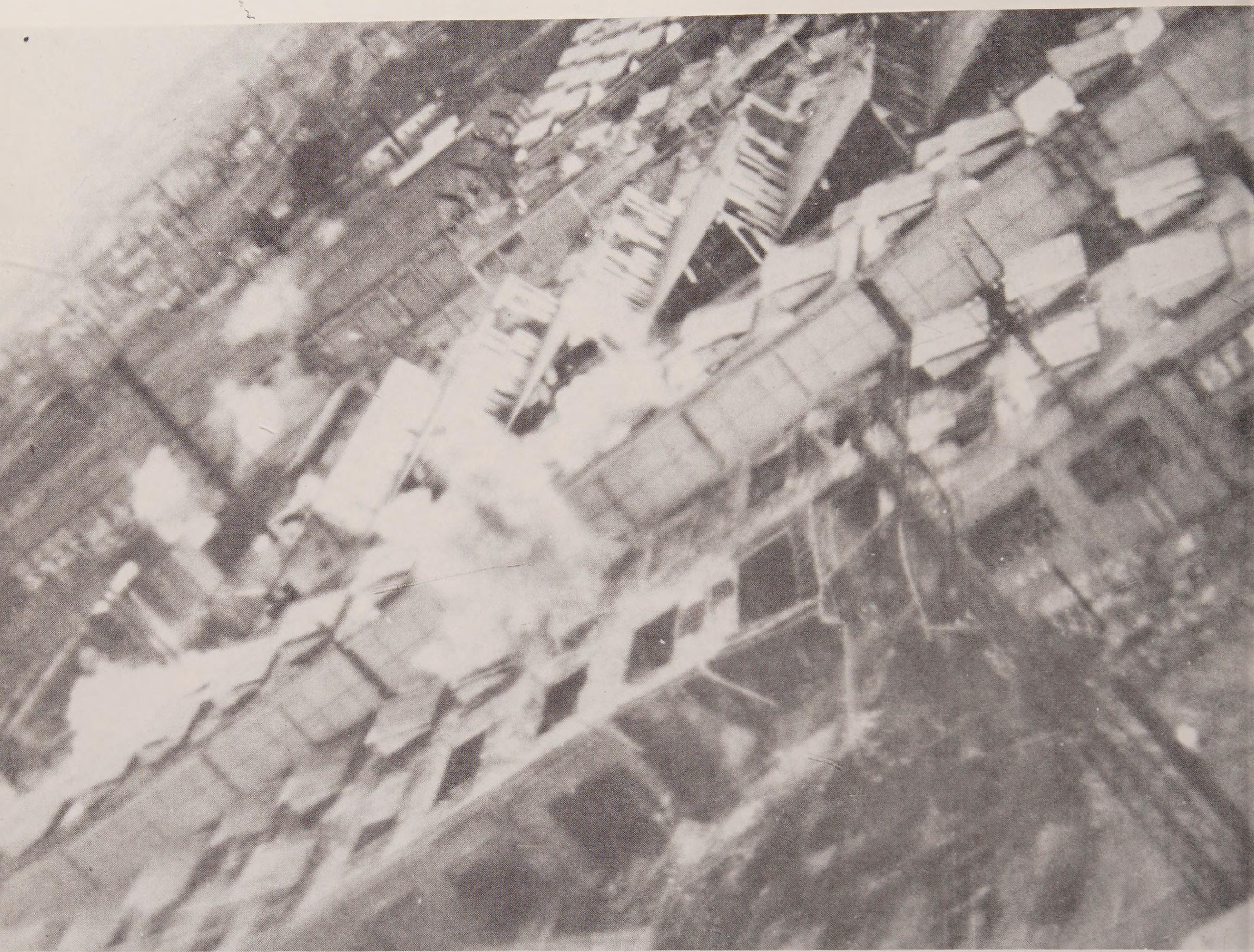
without excessive risk, achieving both surprise and accuracy in the destruction of medium-size, defended targets. Many of these targets were in built-up areas, where care had to be taken to avoid killing friendly people or damaging their property. In the early days the Mosquito day bomber loss rates were a relatively high eight per cent, compared with five per cent for heavy night bombers. The Mosquitoes, however, were flying much more hazardous operations and achieving more efficient destruction. Bomber Command was heavily committed to the four-engined heavy bombers, which were carrying out indiscriminate area bombing with doubtful accuracy, although later helped by pathfinding techniques. Heavy bomber losses also became high in relation to their destructive effort and, as they had larger crews, resulted in much greater crew losses.

The first time 139 Squadron operated with its own aircraft was on a precision raid on the Philips radio works at Eindhoven in Holland on December 6, 1942. They were accompanied by 105 Squadron, led by their new commanding officer, Wg Cdr Hughie Edwards, VC, DFC. Seven out of ten Mosquitoes which set out destroyed th target. Edwards also led nine Mosquitoes against the Burmeiste Diesel Works at Copenhagen on January 27, 1943. These pin-poir raids required about two weeks of hard training and plannin beforehand, which in itself was also hazardous due to the realism obstructions often being hit during low-level flying.

It was learned that both Göring and Goebbels were to address Nazi mass demonstration in Berlin on January 30, 1943, which wa also to be broadcast. This was an ideal opportunity for a demora lising attack on Berlin, not specifically to bomb the site of the rally but to cause confusion and interruption. The Mosquito was the onl aircraft capable of achieving success, so a group of three aircra

*Top right.* **Wing Commander Hughie Edwards VC.DFC. (left) C.O. o No. 105 Squadron with his navigator about to board his aircraft at Marham.** ***IWM***

*Lower.* **Sqd. Ldr. Ralston and his navigator Fl Lt Clayton bombed a railway tunnel entrance 40 miles north west of Paris, and then aft a train entered the other end, he bombed there as well, trapping th train inside.**



**No. 139 Squadron's low level attack on locomotive sheds at Tours on February 18, 1943 showing previous damage and the dust raised by other hits.** ***IWM***

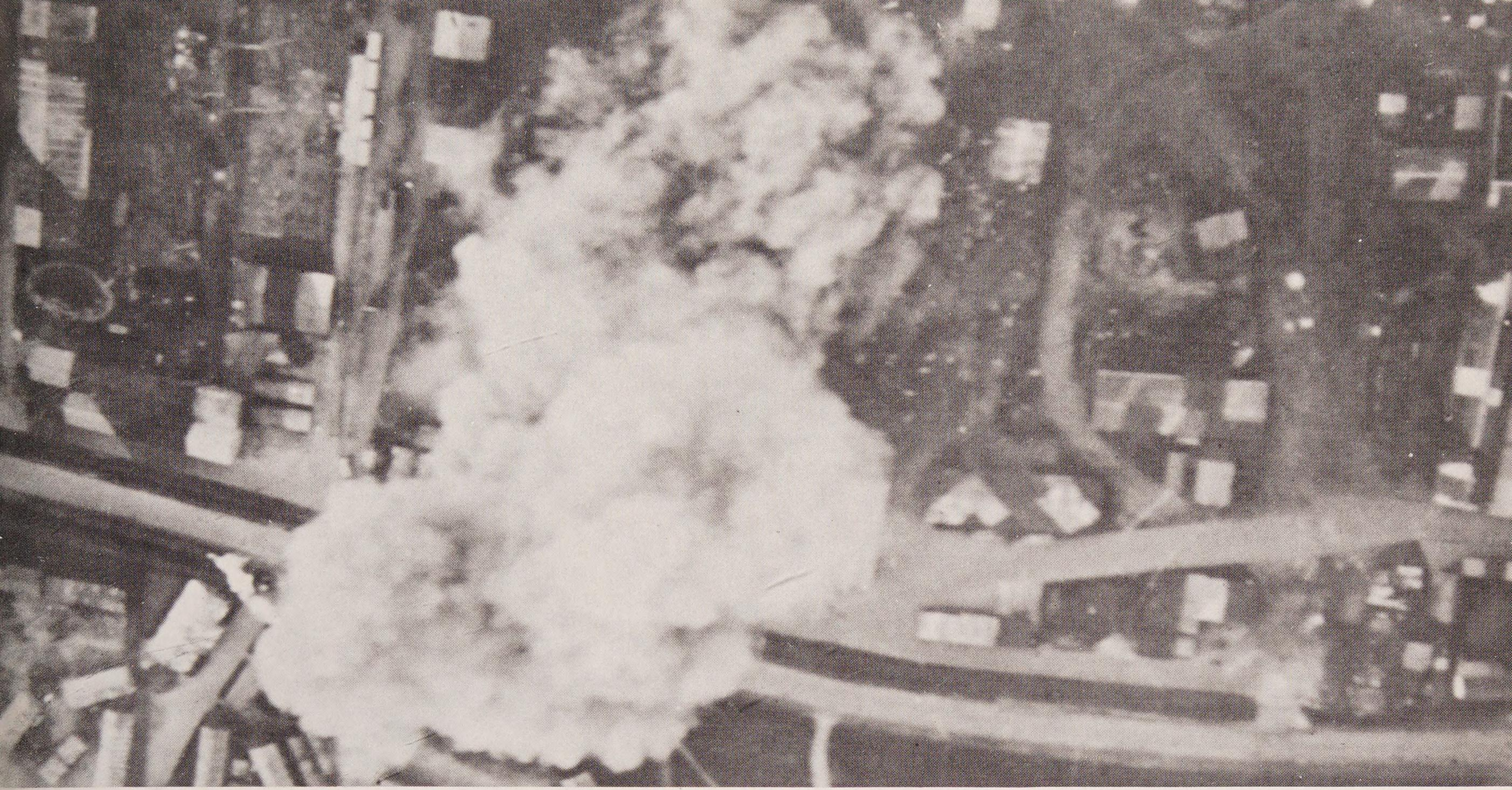
arrived over the city at 11.00hr and dropped their bombs. Göring's speech was interrupted, and an hour of martial music was played while the Prime Minister's speech was delayed. All three aircraft returned safely to Marham, the only opposition being met when passing Bremen on the return leg. A second wave of three aircraft made another attack just before 16.00hr, the last aircraft being lost as a result of flak and fighter opposition. Not only were these raids good morale-boosters for the Allies, but they also provided valuable fuel consumption and timing information which proved useful for planning subsequent attacks on the city.

Other very effective daylight attacks were made on the armament works at Liège on February 12 by 139 Squadron, and on locomotive sheds at Tours, six days later. 105 and 139 Squadrons combined again to attack the U-boat stores at Rennes on February 26, but although there was no opposition from the enemy two Mosquitoes collided while avoiding an airfield, killing the 105 Squadron CO, Wing Cdr Langfield. On March 3, 139 Squadron hit the important molybdenum mine at Knaben in Norway, from where the Germans obtained four-fifths of their total supply. Of the nine aircraft which took part in the raid only one was lost, and all of the bombs wer placed on this small but important target. Amongst many othe medium-sized targets were the locomotive works at Nantes, whic were attacked by eleven Mosquitoes on March 23. Not one bom fell outside the target area, and only an office building was lef standing. When the Philips works at Eindhoven restarte production, four Mosquitoes soon put it out of action again.

The final Mosquito daylight bombing raid occurred on May 27 when the Schott glass works at Jena were attacked by 139 Squadron while 105 Squadron attacked the Zeiss optical works in the sam town. Mosquitoes were lost to the defences over these targets, bu the bombs were placed accurately, some having delayed action fuse to cause continued chaos for some time after the raid.

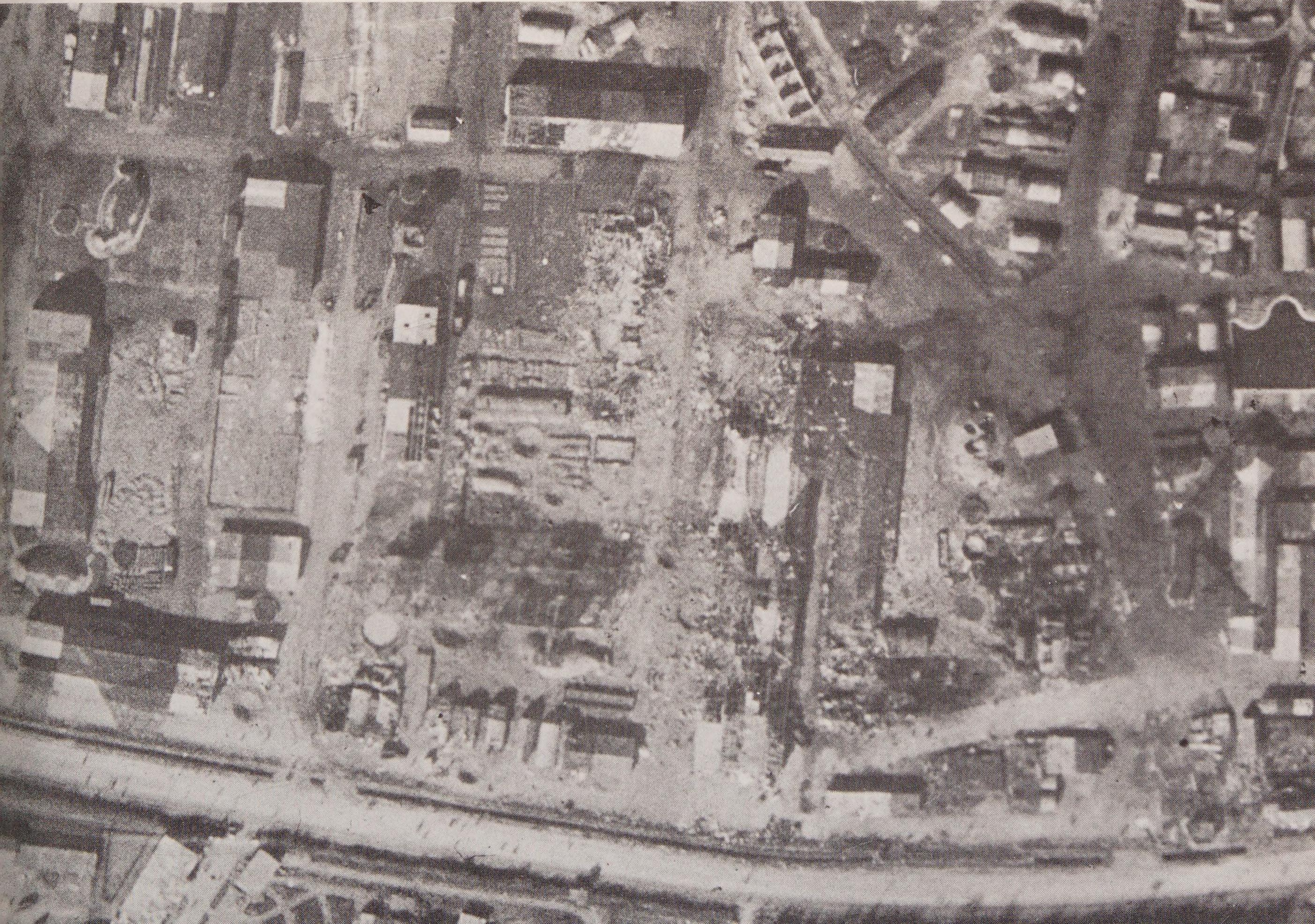
The Mosquito's reputation was improving all the time, and Ai Marshal Sir Arthur Harris, Chief of Bomber Command, gave hi seal of approval to the aircraft and to the use of a small skilled forc relying on speed. This asset also made the aircraft ideal for the eve more important pathfinding work.

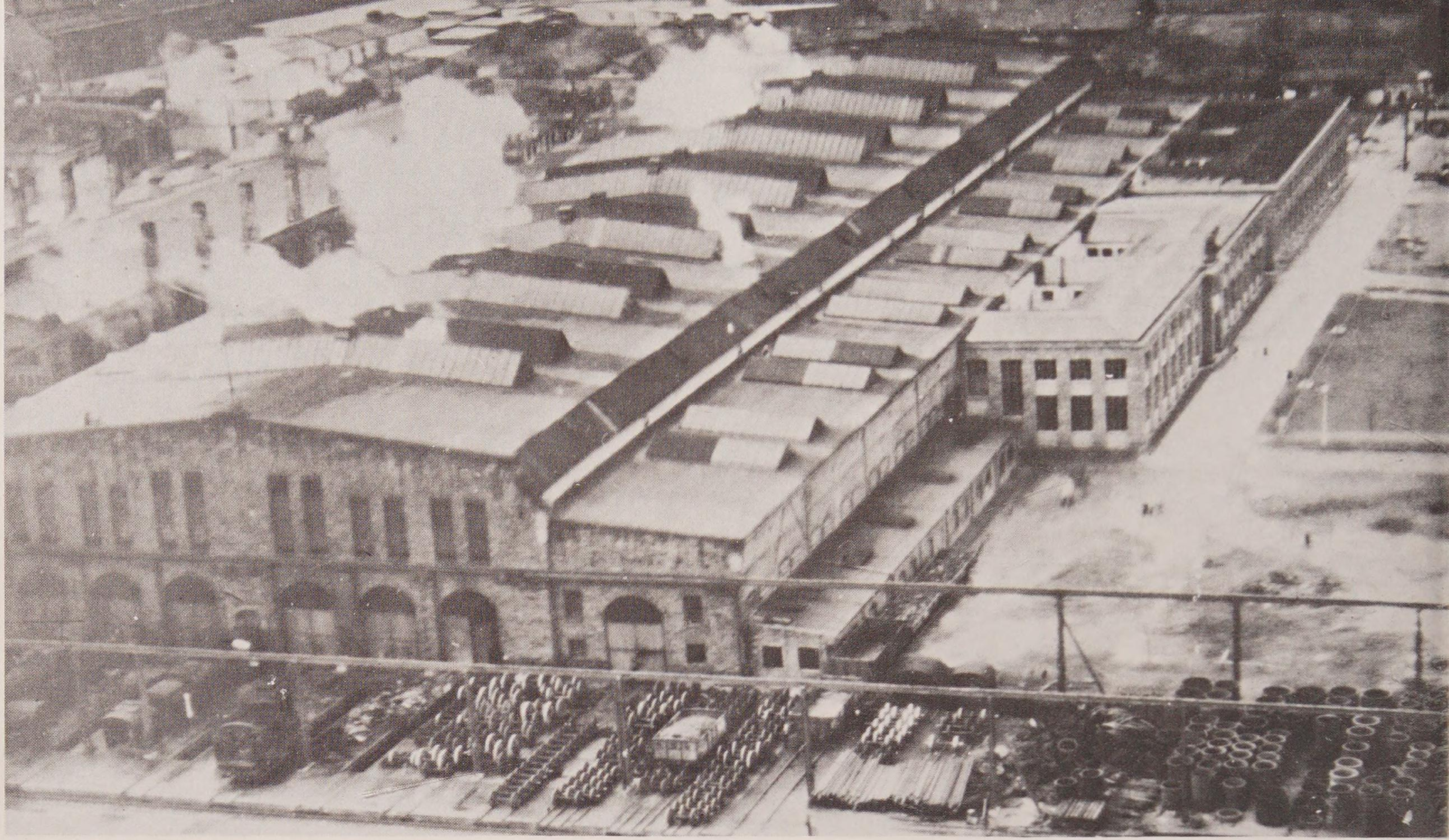
In the year of day bomber operations from May 31, 1942 to Ma 27, 1943, 105 and 139 Squadrons took part, either individually or a a team, in 193 operations from which 48 Mosquitoes failed to return The aeroplane had proved to be outstanding, and was popular wit the crews, particularly for its ability to absorb punishment.



The bombing of the U-boat stores at Rennes on February 26, 1943, just as some of the bombs explode. *IWM*

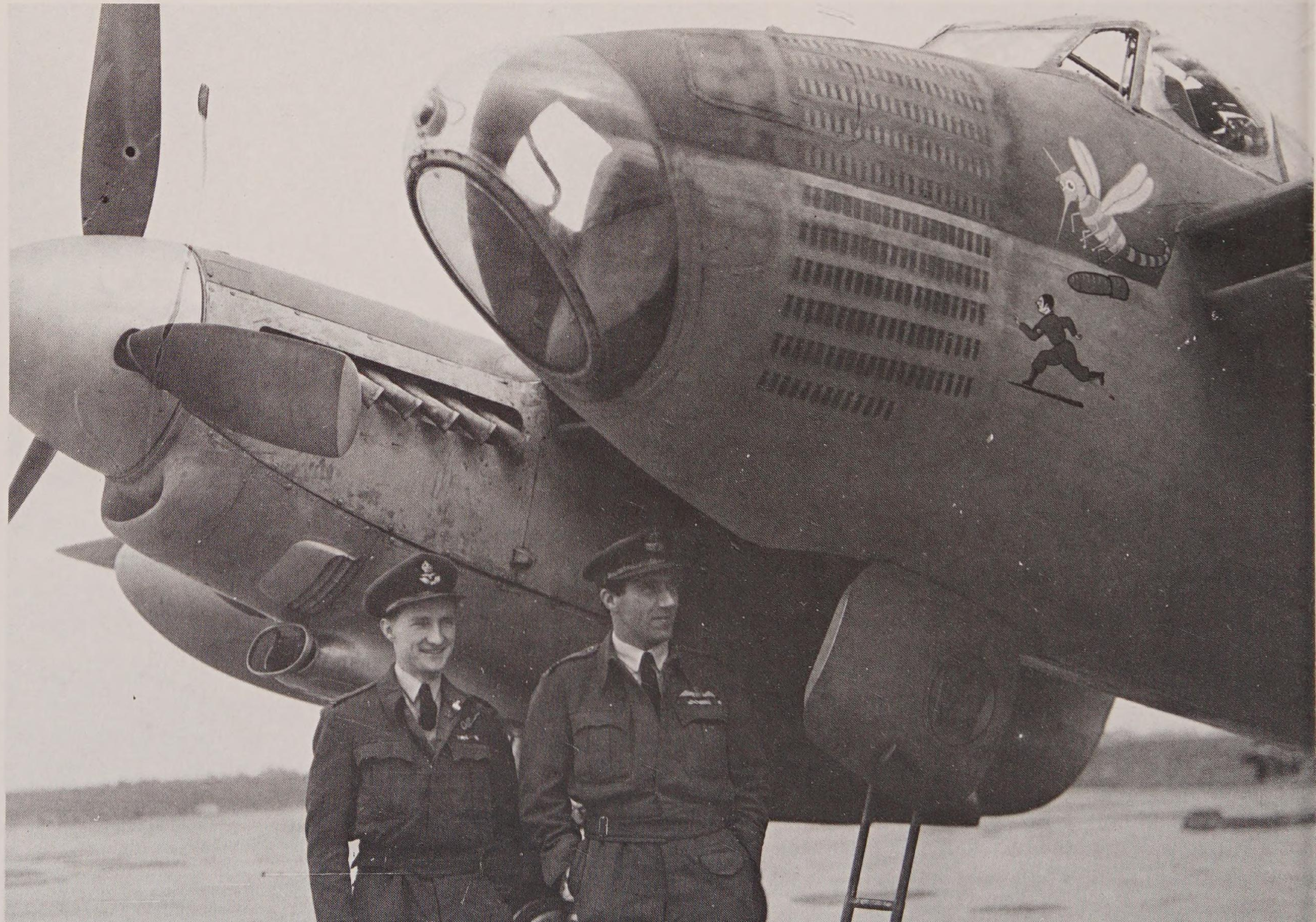
Taken the next day, a photo recce picture shows the extent of the damage. *IWM*





No. 139 Squadron Mosquitoes attacked the locomotive works at Nantes on March 23 1943 leaving only an office building standing. */IWM*

Mosquito B.IV LR503 of No. Squadron, which completed a Bomber Command record of 213 operational sorties. The crew, Fl Lt Maurice Briggs (right) and navigator John Baker, flew the aircraft on a goodwill tour of Canada, but were killed in a crash at Calgary in May 1945.



**No. 109 Squadron Oboe-equipped B.MkIX LR504 after its 190th sortie at Little Staughton on March 1, 1945.** *Crown Copyright*

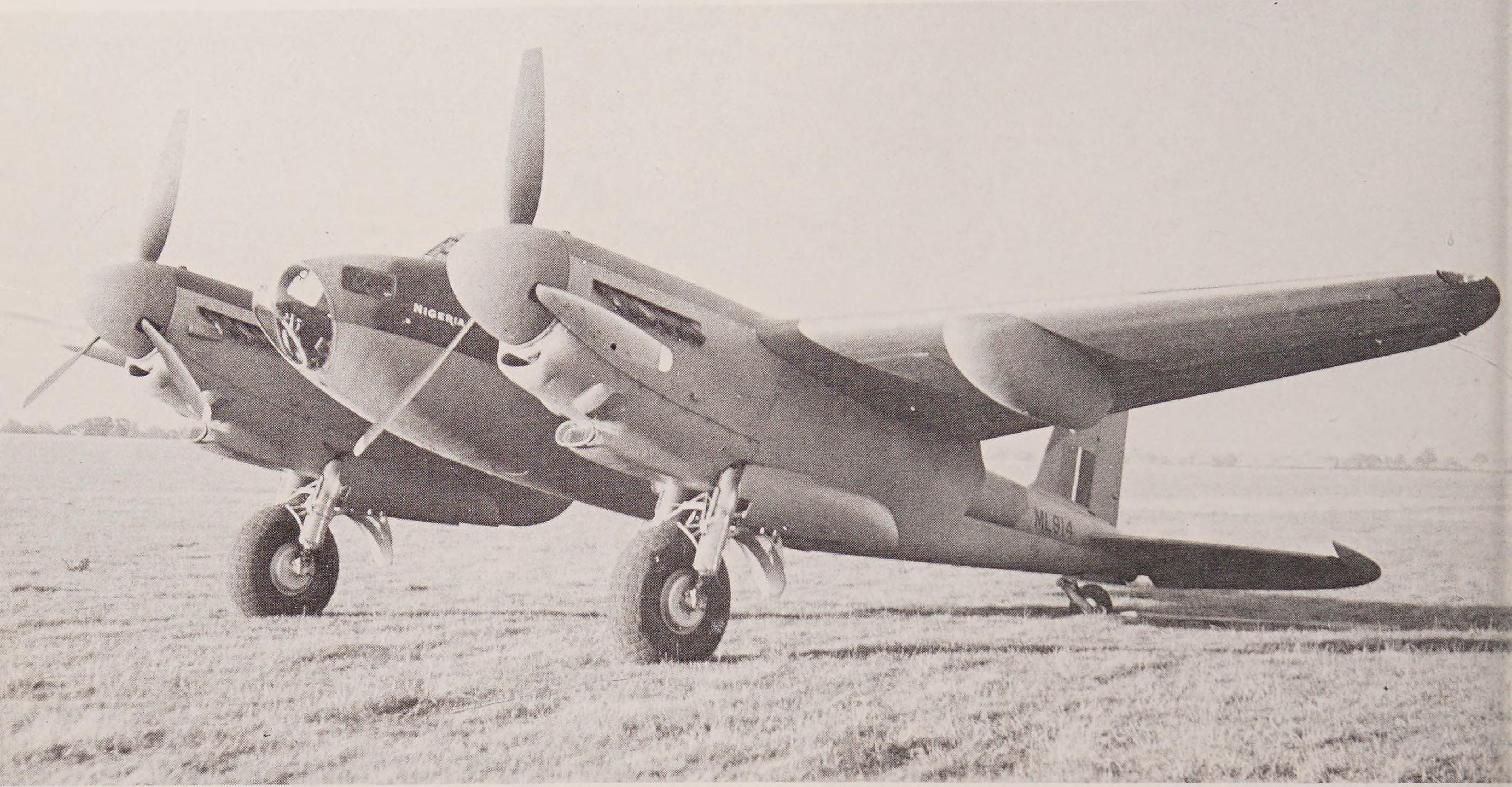
## The Light Night Striking Force

On June 1, 1943, policy changes transferred 105 and 139 Squadrons from daylight tactical bombing duties in 2 Group to 8 Group, already known as the Pathfinder Force, under the command of Air Cdre D. Bennett. No 109 Squadron was already part of this force, having pioneered the use of "Oboe" for pin-pointing target positions.

Re-equipped with Mosquito B.IXs fitted with MkII Oboe (described later in "Pathfinder Force"), 105 Squadron joined 109 Squadron, while 139 Squadron was allocated to night high-level nuisance bombing and used on spoof raids to mislead the enemy as to the main force target. It was initially 105 Squadron which made these nuisance attacks, with a night raid on Berlin on April 20-21 to celebrate Hitler's birthday. The desired effect was achieved, because the enemy believed that Berlin was under a full attack and was unable to send any night fighters to the defence of Stettin, the main bomber target, thus saving the loss of some of our heavy bombers. A final nuisance raid on Berlin was made by 105 Squadron on May 21, the plan being to drop single bombs fitted with screamers. These may not have done a great deal of damage, but they kept the air raid warnings going and disturbed production by keeping the working population idle for about an hour at a time. Those not working were kept awake, and were therefore less fit for work the following day. No 105 Squadron then joined the Pathfinder Force, leaving 139 Squadron to continue with the night nuisance raids.

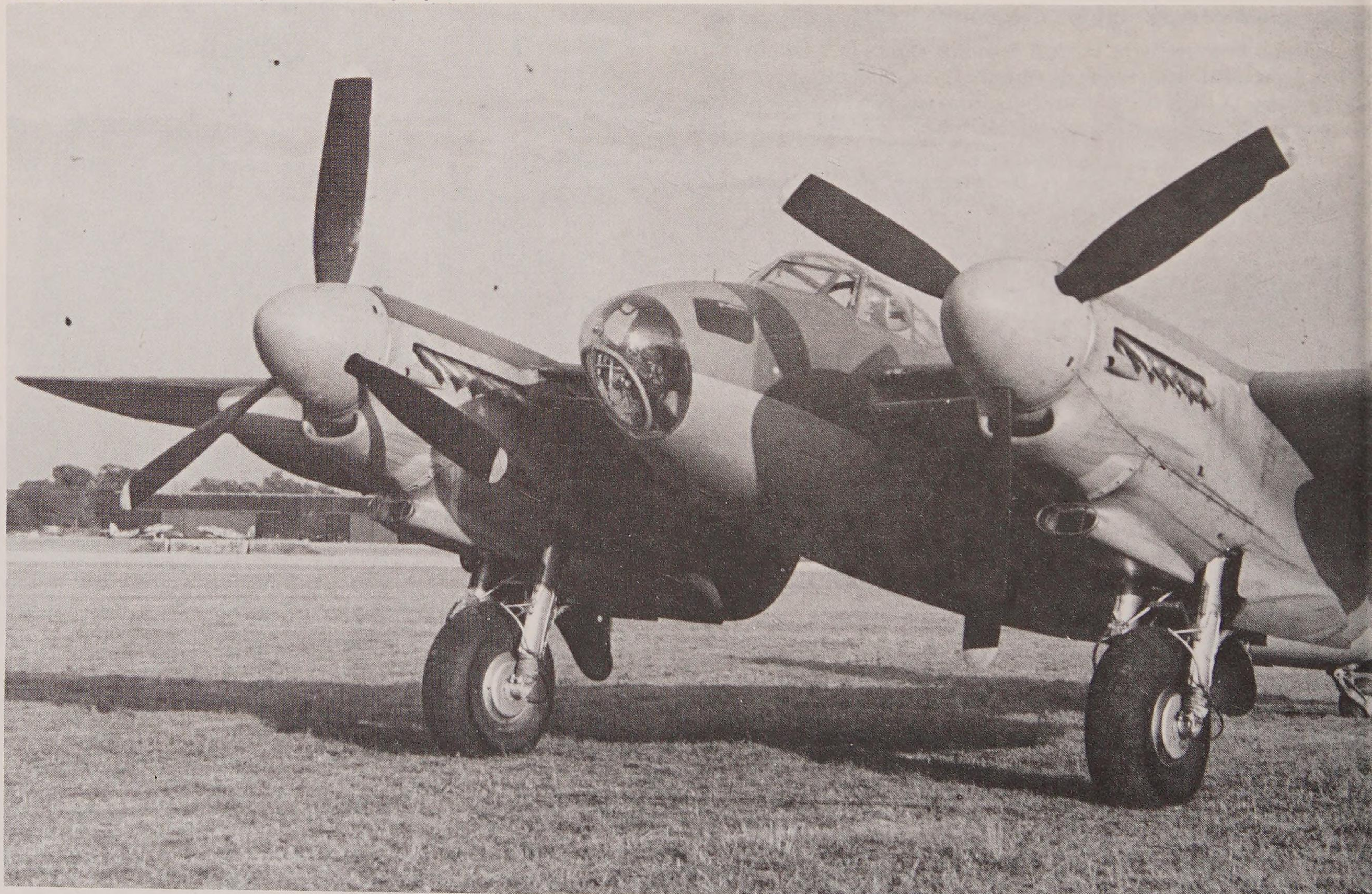
Mosquito losses were much reduced by the cover of darkness, the main threat being flak, against which there was little defence. Care had also to be taken to avoid night fighters. During the autumn of 1943 losses were down to about 1.75 per cent of sorties flown. Although the material damage caused was relatively low, confusion of the defences was the main object, and the results achieved were out of all proportion to the effort expended. Nuisance raids were flown to Hamburg, Duisburg, Cologne, Dusseldorf, Mannheim, Dortmund and Frankfurt, as well as Berlin. For an attack on

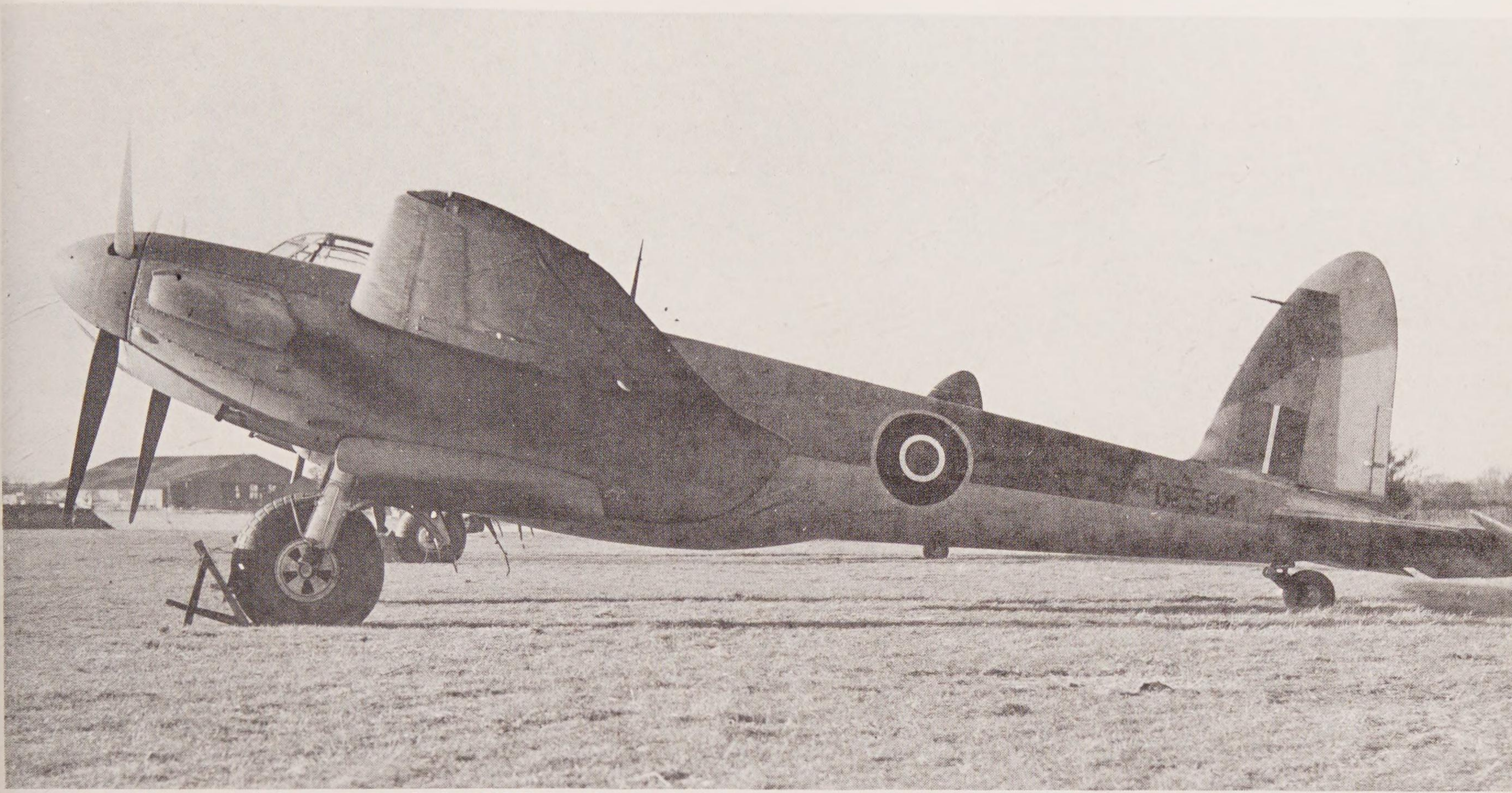
**Wing Commander John Wooldridge DSO, DFC, DFM, Commanding Officer of No. 105 Squadron from March 17, 1943.**



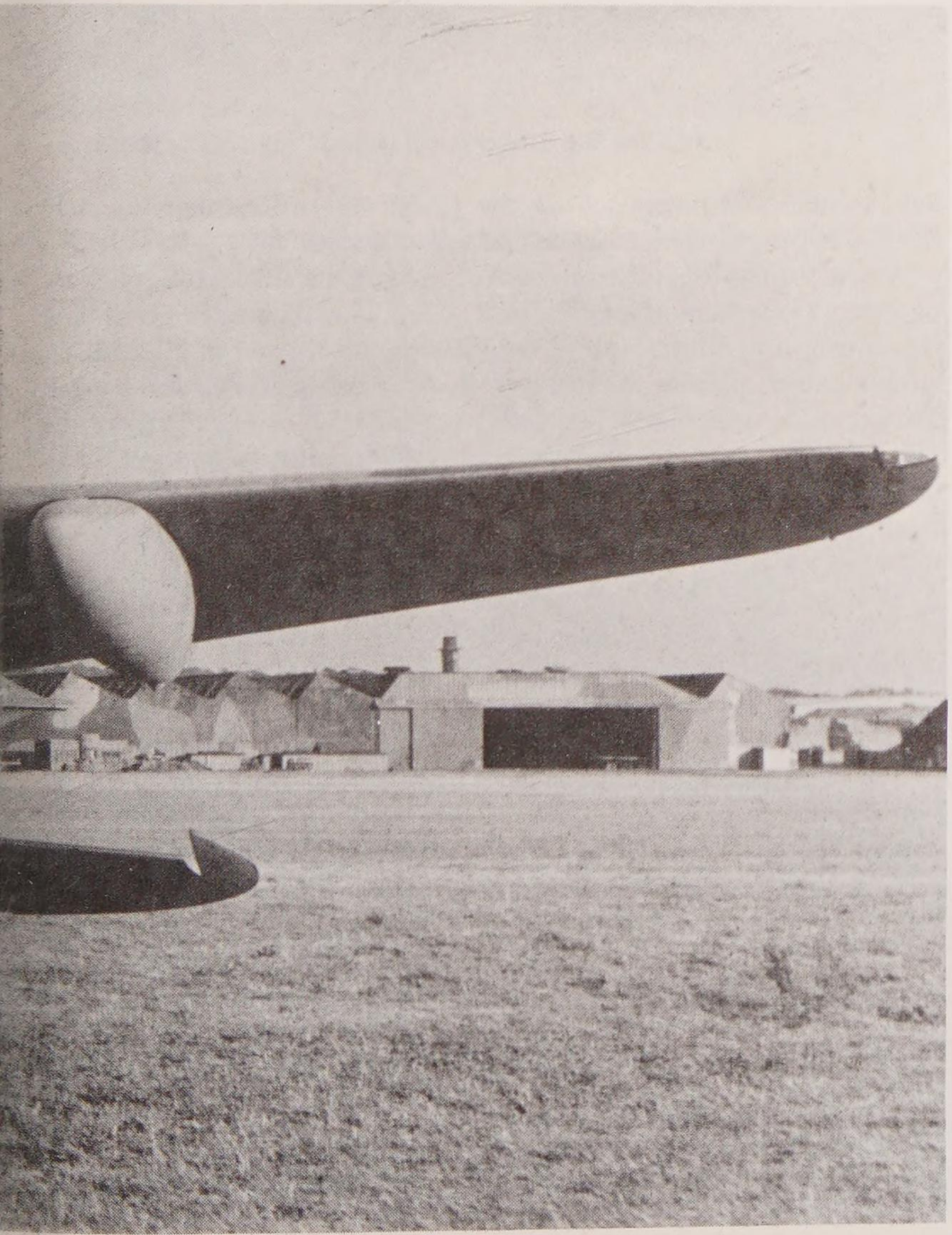
Mosquito B.IX ML914 donated by Nigeria after which it was named, completed 148 sorties with No. 104 Squadron.

Mosquito B.IX fitted with paddle-blade propellers.





**B.MkIV DK594 converted in seven weeks for 4000lb bomb "Cookie" trials and later to serve with No. 627 Squadron.**



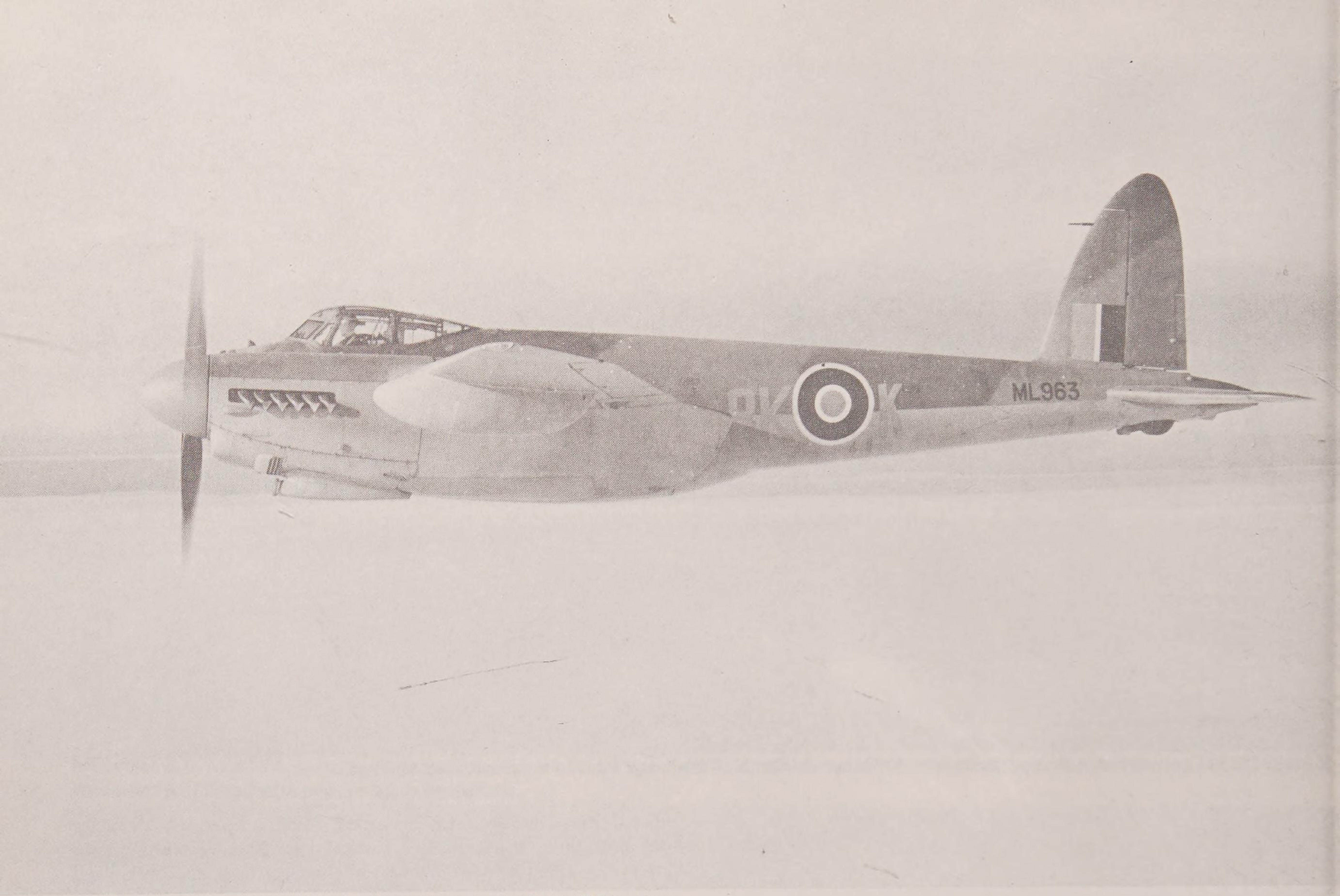
Hanover on October 3, 139 Squadron used the Mosquito MkIX for the first time. Each aircraft carried four 227kg (500lb) bombs internally and two more beneath the wings, the operation being a diversion for a raid on Kassel by the heavy bombers. The result was a great success; the Mosquitoes attracting a number of enemy night fighters and evading them completely. To add to the confusion on these spoof raids, various coloured flares and target indicators were dropped by the leading aircraft to act as aiming points for those that followed. "Window" was also dropped ahead of the main force to confuse the German radar.

As existing squadrons re-equipped with the improved Mosquito MkIXs, XVIs and Canadian-built MkXXs, the MkIVs became available to new units. No 627 Squadron formed at Oakington, near Cambridge, on November 21, 1943, and 692 Squadron formed at Graveley, near Huntingdon, on January 1, 1944, both as part of the Pathfinder Force.

On December 2, 1943, 139 Squadron used the B.XX operationally for the first time for a raid on Berlin flying in three waves dropping window, flares and, finally, bombs. Four aircraft from 627 Squadron bombed on the fires but one was lost, the first loss to this squadron.

In April 1943 the major development of a Mosquito carrying a 1,814kg (4,000lb) bomb was being considered. This load would have equalled that of the B-17 Flying Fortress, although the B-17 could only carry individual bombs no larger than 907kg (2,000lb). In a period of about seven weeks from go-ahead, B.IV DZ.594 was modified as the prototype with a bulged, enlarged bomb bay and new bomb doors. It was tested at Boscombe Down to an all-up weight of 11,430kg (25,000lb). The only problem encountered was with stability, owing to the higher loads. The first operational use of the 4,000lb bomb was shared by 627 and 692 Squadrons on a raid to Dusseldorf on February 23, 1944, when modified B.IVs were used.

A more suitable carrier for the 4,000lb bomb was the Mosquito B.XVI, powered by two-stage Merlin 72 engines and fitted with a



**B.MkXVI ML963, 8K-K, of No. 571 Squadron on April 19, 1944, a few days after the squadron equipped with the aircraft.**

pressure cabin which allowed an altitude of 10,668m (35,000ft) to be reached. Only 0.14kg/sq.cm (2lb/sq in) pressurisation was used, to avoid explosive decompression if hit, but it was sufficient to reduce the cabin altitude by 1,524-1,828m (5-6,000ft). The extra altitude was particularly helpful in avoiding some of the flak, which could reach up to 12,192m (40,000ft), twice the height reached by the heavy bombers. No 692 Squadron introduced the B.XVI to operations on March 5, when they raided Duisburg.

Bomber Mosquito production was still trailing behind, so Air Vice Marshal Bennett requested a fleet of 200 MkXVIs to equip an increasing number of bomber squadrons. A number of these aircraft were completed as PR.XVIs. On April 7, 1944, 571 Squadron formed at Downham Market equipped to half strength with B.XVIs, and the crews were detached to Graveley to gain experience with 692 Squadron in readiness for their first attack on April 24 to commence a sustained night offensive against German cities. It was about this time that 627 Squadron made its final sorties as part of 8 Group's Light Night Striking Force (LNSF).

The use of 4,000lb bombs began to increase in early May 1944, when 139 Squadron target-marked the chemical works at Mannheim and Leverkusen for 19 Mosquitoes carrying the big bombs.

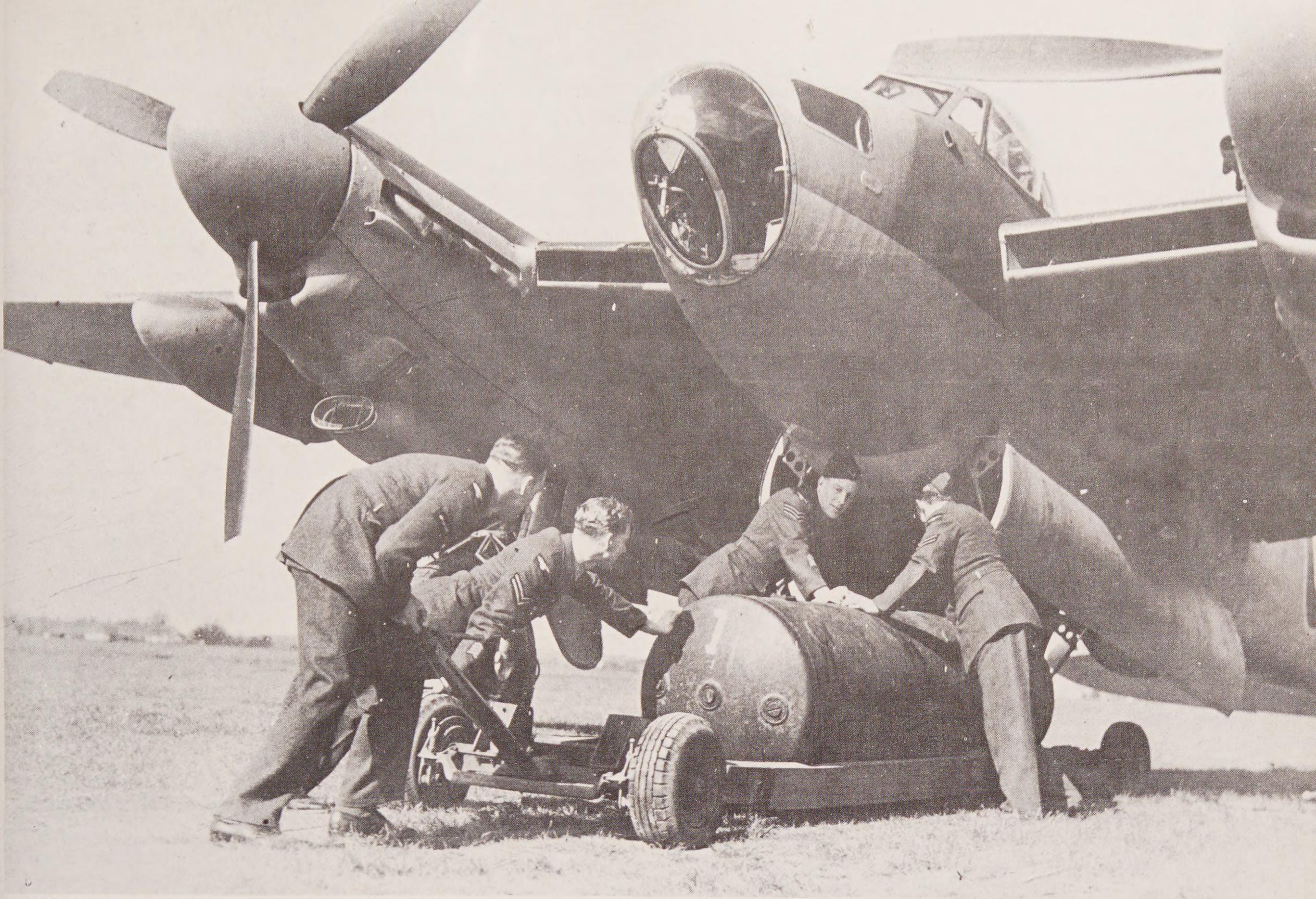
In mid-May the Mosquito gave a further demonstration of its versatility when 692 Squadron dropped mines in the Kiel Canal from low level at night. Altitudes varied from 76-15m (250 to 50ft), closing the canal for over a week, and a further mining operation was made in the Baltic in early June. From the beginning of July the MkIVs were withdrawn from the LNSF operations, leaving only MkXVIs operated by 139 and 692 Squadrons.

A new unit to join 8 Group on August 1, 1944, was 608 Squadron, based at Downham Market with B.XXs. The accuracy of bombing was improving all the time, particularly with the use of H2S radar, which could give an accurate and clear definition of the target. Target indicators could be placed within 1,371m (1,500yd) of the aiming point, and the average raid of 25 aircraft carrying 4,000lb bombs could cause considerable damage. From mid-July to mid-August 1944, 336 big bombs were dropped on Berlin; during the same period 818 V-1 rockets fell on London.

Despite the increasing speeds of enemy night fighters, including the newer but less reliable jets, the Mosquito was still able to maintain a low loss rate of 0.9 per cent, or 59 aircraft lost in 12,517 sorties.

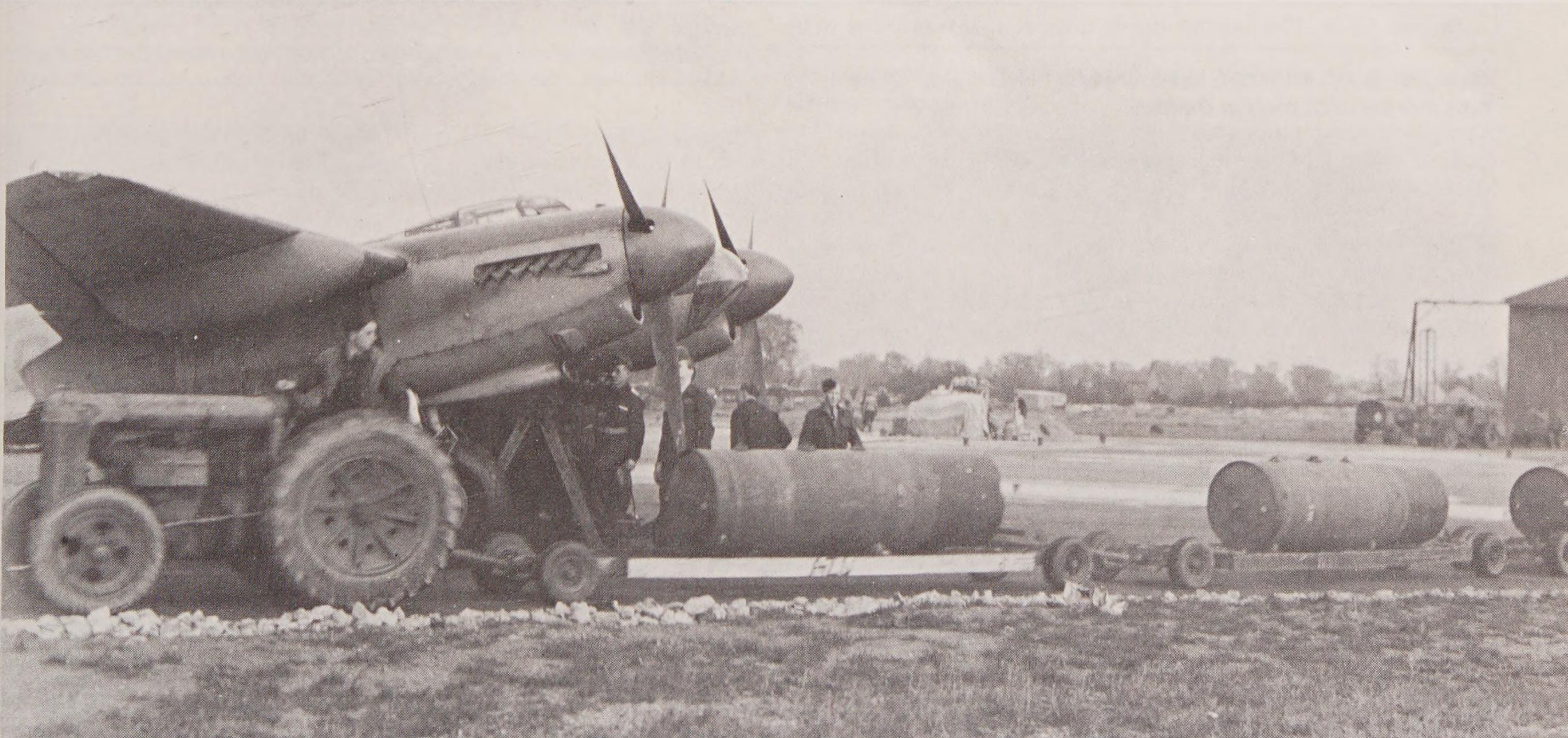
On September 12 692 Squadron led a day attack of heavy bombers on Wanne Eickel, first dropping "window" and then four 4,000lb bombs. The strength of 8 Group began to increase on September 15, when 128 Squadron reformed at Wyton, although it had bombed Berlin five days before it was officially operational, using two B.XXs. These aircraft had powerful single-stage Packard-built Merlins, but could only accommodate the standard 907kg (2,000lb) bomb load. Both 139 and 608 Squadrons had used MkXXVs since early the same month. 142 Squadron reformed at Gransden Lodge on October 25, its first two aircraft arriving two days later in readiness for their first operation to Berlin on October 29.

During November more daylight raids were made using a force of more than 24 Mosquitoes, usually bombing through cloud cover



A 4000lb "Cookie" being loaded into a B.MkXVI.

A train of 4000lb bombs being towed out for loading up in B.XVIs.



with the aid of "Oboe". 162 Squadron reformed at Bourn, near Cambridge, on December 17, 1944, followed by 163 Squadron at Wyton on January 25, 1945, both having Mosquito MkXXVs. The former squadron commenced training on H2S to concentrate on marking, and the latter unit was principally engaged in nuisance raids, often to Berlin. At last the number of Mosquitoes available for night bombing operations was approaching the desired 200 aircraft, allowing a 91- Mosquito bomber raid on Berlin on the night of February 1-2, 1945, and building up to a series of regular night attacks. The last Mosquito day bomber raid occurred on March 6, when 128, 142, 162 and 571 Squadrons bombed Wessel through cloud, using "Oboe", Unfortunately, the result was inconclusive owing to two of the marker aircraft colliding in mid-air. 162 Squadron had only just commenced operations as the second H2S unit with a few of its aircraft so equipped; the remainder operated with the bomber force. 608 Squadron continued operations, re-equipping with MkXVIs from March 26 and flying them with MkXXs from early April.

The largest Mosquito attack on Berlin came on March 21-22, 1945, when 138 sorties were despatched in two waves by aircraft of 139, 128, 142, 162, 163, 571, 608 and 692 Squadrons, some crews flying in both waves. Only one Mosquito was lost. The last Berlin attack took place on the night of April 20-21, when 59 Mosquitoes reached their target. Berlin had been the target for nearly 4,572 tonnes (4,500 tons) of bombs from 8 Group Mosquitoes during almost 4,000 sorties between January 1 and April 21, 1945. On May 2-3 Kiel became the last German town to experience a Bomber Command Mosquito attack, when eight squadrons despatched 63 aircraft in the first wave and 53 in the second.

Overall the Light Night Striking Force and 8 Group Mosquitoes flew 27,239 sorties for the loss of 108 aircraft, 88 more being written off as a result of battle damage.

## Pathfinder Force

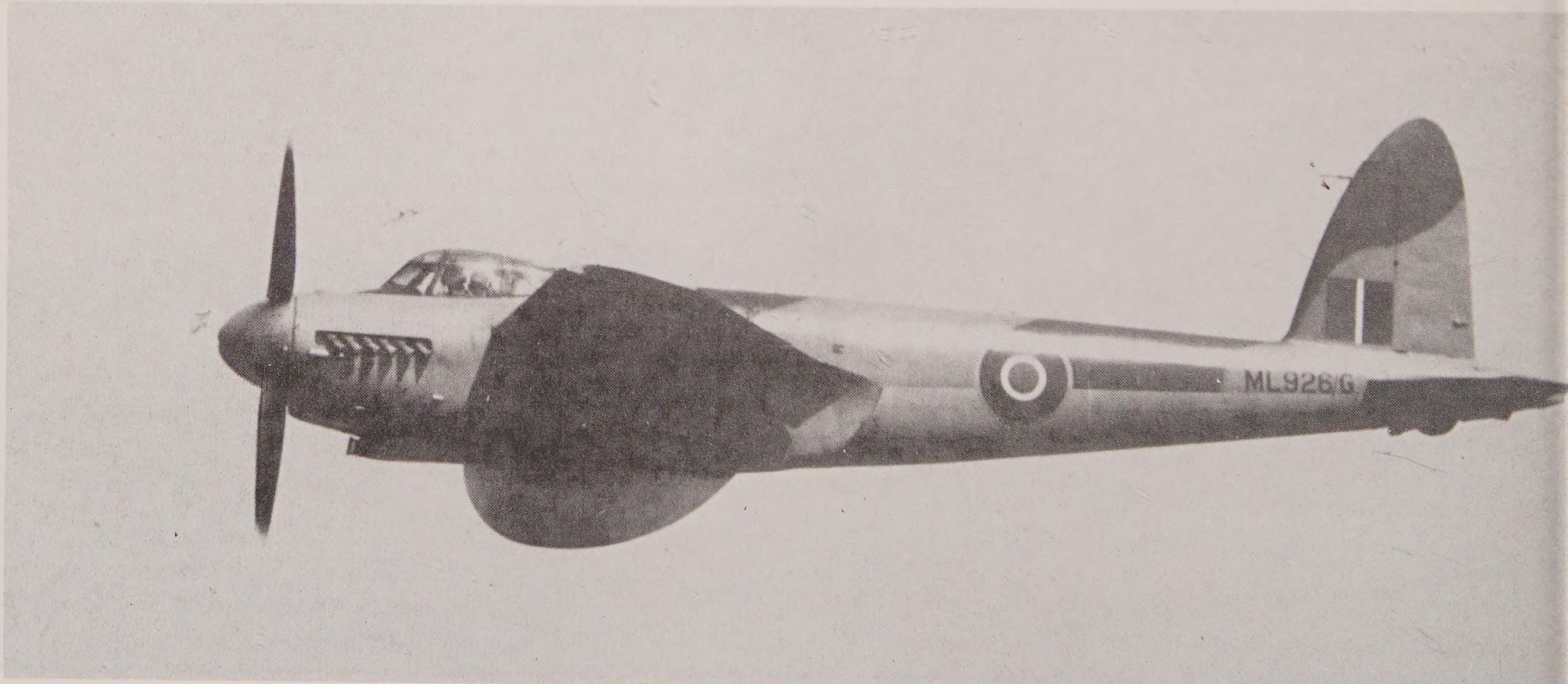
One of the most vital and demanding roles for the Mosquito bombers and their crews was the marking of the targets for Bomber Command raids. The average heavy bomber raid was found to be scattering its loads far and wide, often missing its target area altogether, and suffering appalling losses to no avail. The Mosquitoes could fly rapidly through heavily-defended areas, usually at about twice the speed of the "heavies", and place illuminated markers accurately within the target area, using the "Oboe" bombing aid from very high altitudes. H2S radar was also used by Pathfinder Mosquitoes, the aircraft forming Bomber Command's spearhead.

Devised in 1941 as a bombing aid, "Oboe" comprised two ground stations about 161km (100 miles) apart and transmitting radio pulses to the Mosquito at different rates. The "cat" station accurately measured the range by radar along its directed track, while the "mouse" calculated and signalled to the aircraft crew the moment of weapon release. The limitation of this aid was the signals travelled in straight lines at a tangent to the earth's surface from the point of transmission, and therefore the range was limited to the maximum altitude of the aircraft. To increase the range, repeater equipment for carrying in another Mosquito was developed as "Oboe II" for use towards the end of 1944, and this increased the range to about 442km (275 miles) at 8,534m (28,000ft). Another limitation was that only one Mosquito could be controlled at a time until "Oboe MkIII" came into use in April 1944. This allowed the control of four aircraft on one wavelength, thus keeping the target indicators burning continuously. "Oboe" could not be carried in the heavy bombers as its success depended on manoeuvrability, range, altitude and stability, as well as an immunity from enemy interference, even during the vulnerable run in to the target.

The overall commander of Pathfinder operational developmen and, later, its operation, was Grp Capt D. C. T. Bennett, CB, CBE, DSO. The first Pathfinder aircraft, DK300, was allocated to 109 Squadron at Stradishall on July 21, 1942, for the installation of the special radar equipment. Oboe allowed the Mosquitoes to bomb through cloud without any visual reference externally, and was first used operationally on December 20, 1942, when six Mosquito MkIVs left Wyton for the coking plant at Lutterdale, in Holland. The nearest hit on this raid was within 183m (200 yards) of the target. In cases where the cloud cover obscured normal ground target markers, the Mosquitoes dropped sky markers, as used on a Dusseldorf raid by 83 Squadron Lancasters on December 31.

Early results were inconclusive, but in the belief that the target marking was reasonably accurate a raid was made on the haze-

**Mosquito B.XVI ML.926/G used for radar bomb sight, "Oboe" repeater and H2S trials at Defford.**



**Air Vice Marshal D.C.T. Bennett chairing the briefing for the start of another Pathfinder operation at the Wyton HQ in October 1944.**

shrouded Krupp works at Essen on March 5, 1943. This target had always been difficult to identify and hit in the past, but a force of eight Oboe-equipped Mosquitoes, followed by a back-up of eight H2S-equipped Lancasters from 83 Squadron, marked for a force of 442 heavy bombers. This proved to be the most effective raid delivered by Bomber Command up to that time, and confirmed the accuracy of the aids.

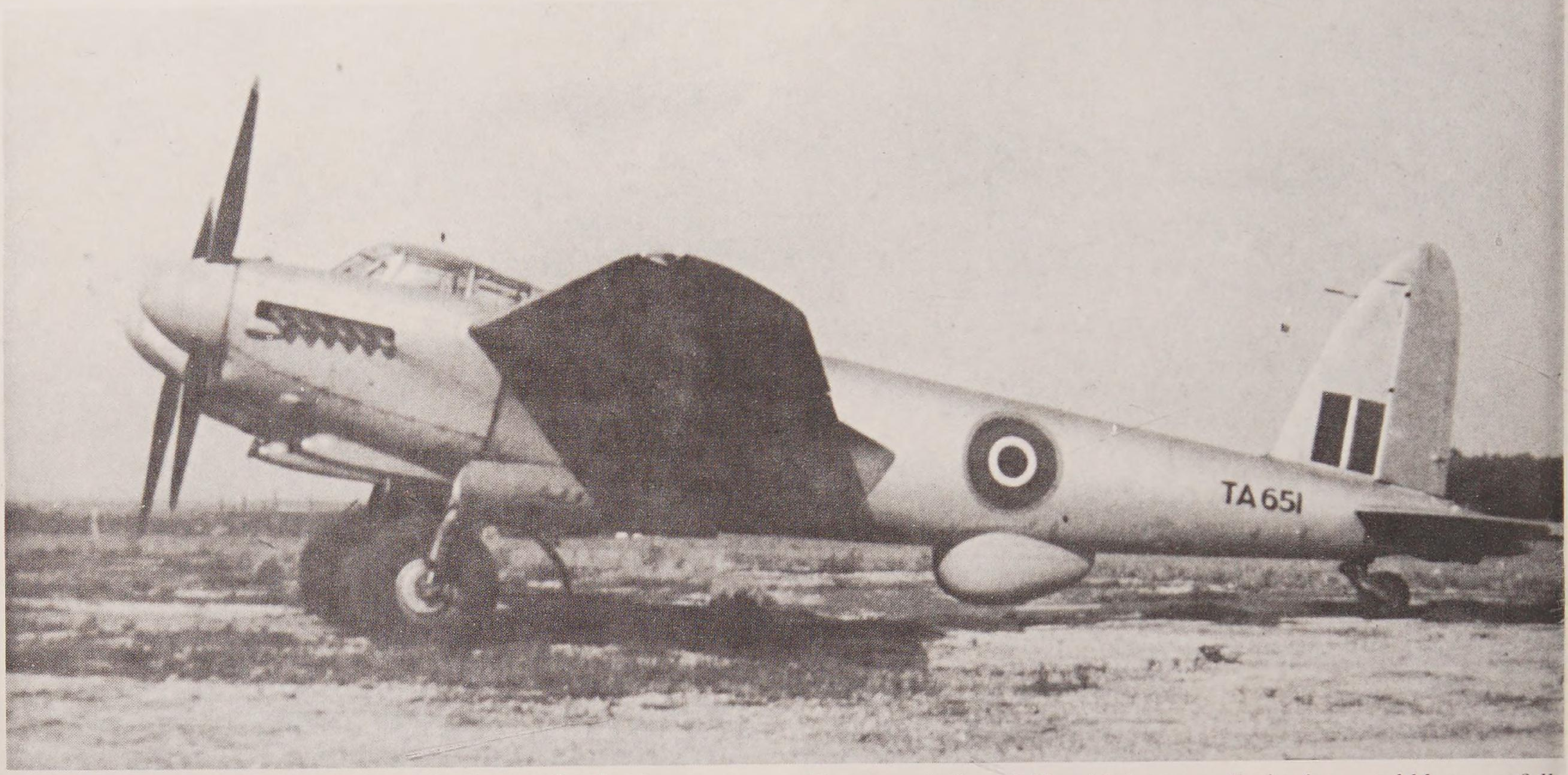
To reduce the risk of the loss of the valuable equipment, particularly to enemy intelligence, Oboe Mosquitoes were only used to mark large-scale attacks from early March. In June, 1943 109 Squadron used the B.IX Mosquito for the first time, taking advantage of its higher ceiling by reaching 9,144m (30,000ft) at 470km/hr (230mph) on a raid on Dusseldorf. This extended the range of Oboe and also decreased the risk of enemy hits. The first Oboe carrying Mosquito was lost on March 26, when it crashed in the North Sea, and on May 12 one came down in flames near Essen.

With the major policy changed on June 1, 1942, the squadrons in 2 Group left Bomber Command with the exception of 105 and 139 Squadrons, which remained at Marham as part of 8 Group. 105 Squadron joined 109 on July 5 as the second Oboe unit, using five MkIXs from 109 Squadron to get started. In the same month a third ground station was commissioned, allowing 18 Mosquitoes to be controlled in one attack. Taking advantage of this, the two squadrons led a successful return raid of 599 heavy bombers to the Krupp works on July 25.

When the heavy bombers operated beyond the range of Oboe the Mosquitoes were allocated to more specialised targets, such as power stations, foundries, railway installations and individual factories.

Accuracy was improving with experience, and a load of six 227kg (500lb) bombs could be placed within 91.4m (100yd) of the target 80 per cent of the time from altitudes of 8,534-9,144m (28-30,000ft). One particularly good example was a direct hit on a lock gate from 8,839m (29,000ft) at night, which would have been difficult enough in daylight. These pathfinder techniques were also used against V-1 launch sites in France, night fighter bases and, later in conjunction with the fighter bomber units, against the rail network in France and the low countries.

Pressurised Mosquito MkXVIs were first delivered to 109 Squadron on December 10, although the first sortie with this version was not until March 1-2, 1944, when Deele was the target. As the summer progressed, with its short nights, daylight target marking was made on V-1 supply depots, gun emplacements and troop concentrations in support of the Normandy landings. On October 3 five Mosquitoes led 259 Lancasters on a raid to breach the sea wall at Westkapelle, to flood the island and put the heavy guns out of action. However, the guns held out until softened up more directly at the end of the month. From mid-October, the big cities again



**Mk35 TA651 fitted with H2S radar under the rear fuselage.**

became targets, the Pathfinders not only leading the heavy bombers, but also other Mosquito bomber squadrons.

The first time an Oboe Mosquito was shot down by enemy fighters was on a daylight raid to Cologne on December 23. The Mosquito was rather more vulnerable in this case, as it was operating at 5,181m (17,000ft) with some Oboe-equipped Lancasters, despite their unsuitability for the task. Four enemy fighters attacked and shot down one Mosquito, and two Lancasters were also damaged by the fighters. Another Lancaster was shot down by flak after completing its bombing run, having been hit and set on fire on the run in.

On March 12, 1945, 21 Mosquitoes marked for the biggest ever raid on Germany, when 1,000-plus aircraft attacked Dortmund. In contrast, two days later one out of four Mosquitoes despatched marked the Bielefeld viaduct for a successful attack by 617 Squadron, one of whose Lancasters carried a 9,979kg (22,000lb) bomb.

The increased range of Oboe and the advance of the allied troops across the continent enabled targets deeper in enemy territory to be marked. On April 8, 1945, two aircraft from 105 Squadron andthree from 109 marked Berlin, starting a series of almost nightly attacks, leading other Mosquitoes, until the last bombing attack on the city on April 21. All major targets were now within Oboe range. The contribution made by just two squadrons of Mosquitoes was out of all proportion to their numbers, and the loss rate had been amazingly low.

Oboe Mosquitoes operated mainly with the heavies against specially-selected targets, but 139 Squadron was equipped with an aid known as G-H, later H2S, and usually led the LNSF. 139 Squadron introduced G-H, a radar system in which the navigational aid "Gee" was combined with the H system. This device worked like Oboe in reverse, the position plotting being done aboard the aircraft. Initial raids were dogged by failure of the equipment, but the first successful raid came on October 10-11, when Dortmund was attacked. 139 Squadron operated entirely at night and pioneered the use of Canadian-built Mosquito bombers. However, before G-H, with its range limitation, could become fully established, it was superseded by H2S, which was a radar carried in the aircraft itself, all transmissions being to and from the aircraft. The aircraft carried Gee in the nose, with the display on the right hand side of the panel, and the H2S display was behind the pilot, to the left of the navigator. The screen showed ground features, and was ideal for the Mosquito. Although it was not as accurate as the other aids, it had no range limitations.

No 139 Squadron commenced operational H2S trials with Mosquito IV DZ476 in January 1944, and Berlin was the first to be attacked by H2S-equipped aircraft on February 1. By this time a mixture of MkIVs, IXs, XVIs and XXs with G-H or H2S were being operated. H2S was installed in the MkXVIs for operation in March and, by the end of the month, 139 Squadron was flying about half the aircraft with the new aid. Although the Mosquitoes were able to operate high and fast, they were still occasionally vulnerable to flak, especially when "window" was not dropped to confuse the defences.

At about this time, a young Flight Lieutenant named Reg Davey was based with 218 Squadron at Downham Market as a navigator on the heavies. He had completed two tours and had a yearning to join a Mosquito squadron, having seen the aircraft operating from nearby Marham. One of the tests he had to pass was a decompression test to 11,277m (37,000ft) for two hours, with one hour on the build-up and another hour "coming down" again. Despite pressurisation the crew was on oxygen all the time, as their cabin altitude was still very high.

There was a long waiting list for the Mosquitoes, but in February 1945 Reg was posted to 16 OTU at Upper Heyford, where he started learning the new navigation techniques in Oxfords before his first Mosquito flight. This was made in a Mosquito MkXX from Barford St John, an Upper Heyford satellite. The Mosquito was about twice as fast as the heavies, and therefore much more demanding on both crew members. Navigation was performed using a specially-prepared Gee chart to match up with the aid. Owing to the considerable reduction in space from a heavy bomber, the charts had to be held on the lap, with all instruments, such as pencils, dividers, etc, carried on the person. Unlike the draughty heavies the Mosquito was very warm, and Reg often used to fly wearing his life-jacket over a pullover. Although one-man dinghies were supplied, they were often left behind, as they were too warm and uncomfortable on long trips. The aircraft were equipped with "Gee" for navigation and H2S for target identification, and the training flights around the British Isles usually lasted about three hours. However, some crews found it difficult to adapt to the speed of the Mosquito and a number were lost during training, particularly whilst landing.

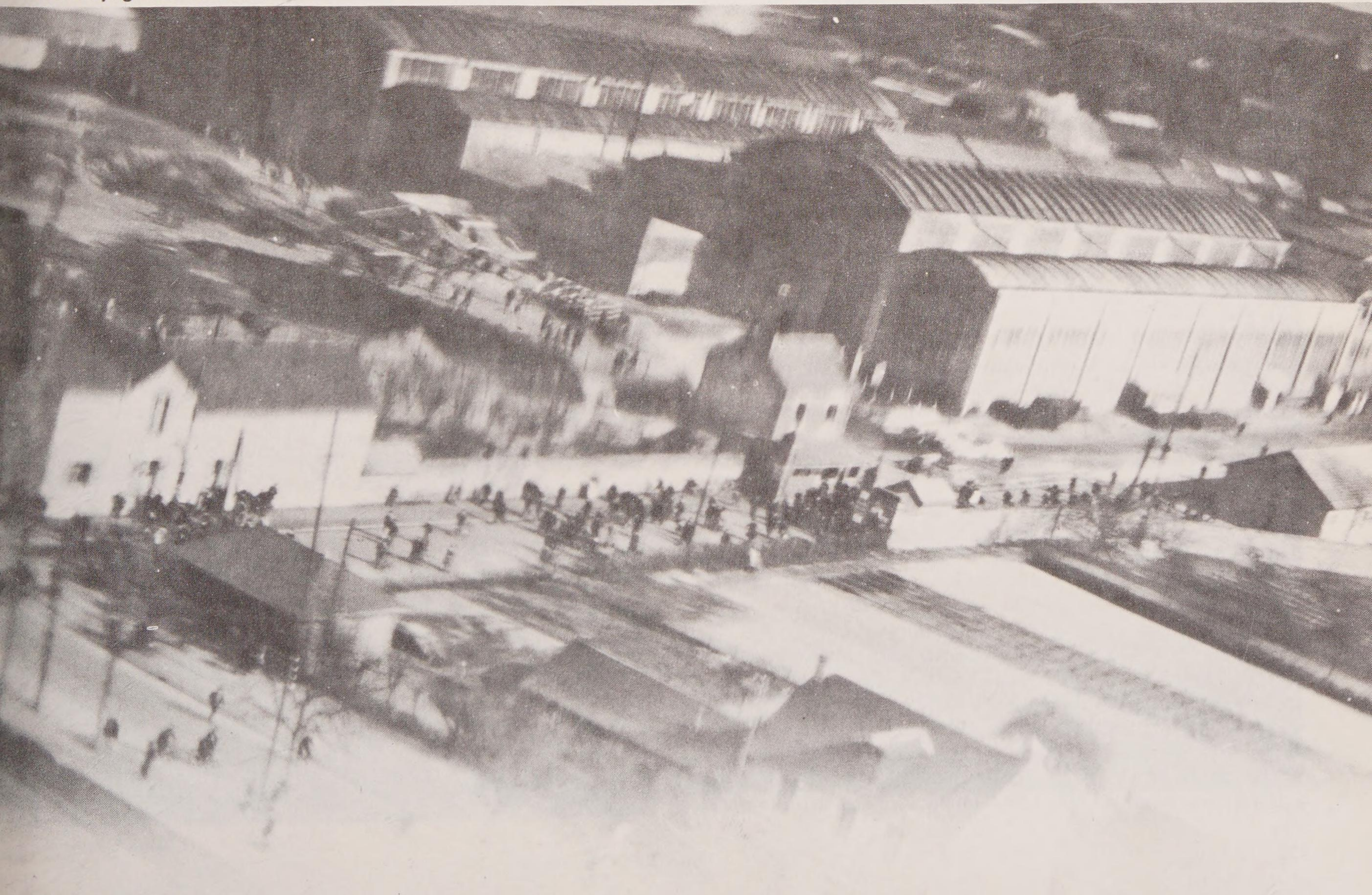
From 16 OTU Reg moved to the Pathfinder Training Unit at Warboys, where a very high standard of navigational skill was required by Don Bennett, who was a perfectionist. Often three sorties a day were flown on high-level training, including practice for daylight bombing runs and dive bombing, despite the fact that the basic training concentrated on night work and any error had to be less than five per cent.

Reg Davey's first active sortie was to Kiel in Mosquito MkXXV KB399 on April 23, 1945, the day after he joined 139 Squadron at Upwood. His aircraft carried three 500lb bombs and a flash target indicator. At each turning point a colour of the day Very Light was fired to guide the non-H2S-equipped Mosquito force, which bombed on the TIs. On this raid there were eight Pathfinding Mosquitoes leading a 50-100 Mosquito main force carrying 1,814kg (4,000lb) bombs. On the return across the North Sea Reg wished he had put up with the discomfort of his dinghy, as the starboard engine blew up and burned. The fuel was turned off and the extinguishers operated, but it was only by diving at high speed that the fire was put out. Then the port engine began to play up, so the pilot gave the order to bail out. However, one stood a poor chance of survival without a dinghy in the cold sea, so Reg opted to stay. As the pilot was also without his dinghy they agreed to press on, calling Woodbridge on a "Mayday". Guided by the searchlight, they made a direct approach and landed safely. It transpired that the engine and its electrics had been packed with grease after manufacture, and it had never been cleaned off.

Reg flew two more sorties to Kiel, dropping four 500lb bombs on the second trip and marking the turning points; the final trip was similar to the first, but thankfully without the dramatic return. Once over the target, the pilot would release the bombs while the navigator photographed the H2S screen to record the target position.

The Squadron then went on to training, and flew a few low-level "Cook's Tours" over Europe to survey the damage until aircraft were lost by striking cables strung across valleys. Reg was then posted to 627 Squadron at Woodhall Spa in July 1945 to train on Mosquito XVIs which were to lead Avro Lincolns against Japan, using H2S as a guide. Special charts had to be drawn up to match the radar picture of ground features, although much of the flying would have been for 7-8hr over water, which was not a popular idea with the crews. The squadron ground crews left for Asia in August 1945, but the atom bomb was dropped before the aircraft could follow. Reg last flew in a Mosquito in September 1945, and remembers it as a thoroughbred of the air which, to the unwary, could be difficult on take-off or landing. He still maintains a contact with the aircraft, as he spends some of his spare time helping at the Mosquito Aircraft Museum.

On December 18, 1944, 162 Squadron formed at Bourn, equipped with Canadian Mosquitoes. They specialised in what were



**Mosquito attacks were often so quick that they came as a great surprise to any people around the target. While bombs fell through the factory roof the workers were cycling home, during a daring low level daylight attack.** ***IWM***

known as "Siren Tours", flying throughout the night, keeping the night shift in the shelters and the day shift out of bed. During February they started working with H2S, commencing with a marker raid on Berlin on March 3 which, like other targets, was shared with 139 Squadron.

Probably the most famous bomber squadron of all time was No 617, the "Dam Busters". About three months after their dams raid, on August 30, 1943, they received their first Mosquito, having moved from Scampton to Coningsby. The first time the type was used operationally by the unit was on April 4, 1944, when Grp Capt Leonard Cheshire marked an aircraft factory at Toulouse. By April 10 four Mosquitoes had been delivered, and one method of attack then gaining favour was to mark in a dive. During a raid on Munich on April 24, Grp Capt Cheshire led the raid in an FB.VI, diving from 3,657-914m (12,000 to 3,000ft). He then distracted the defences by flying over the city below 213m (700ft), remaining under fire for about 12 minutes before fuel shortage made it necessary to depart. As a result of his courage on this and other operations he won the Victoria Cross, one of the few occasions when it was not awarded for a single heroic act. The Mosquitoes were used by 617 Squadron to lead their own Lancasters on precision attacks, dropping "Tallboy" bombs on such difficult targets as the Saumur Tunnel and the Weapons Site at Watton.

Eleven months after the dams raid the "Dam Busters" were joined at Woodhall Spa by 627 Squadron. As previously mentioned, 627 Squadron had formed as a light bomber unit at Oakington on November 12, 1943, at first with the elite Pathfinder Force in 88 Group, but it was re-allocated to 5 Group on the move to Woodhall Spa. The intention was for 627 to mark for 617 Squadron, but with the adoption of diving attack without the use of bombing aids by 5 Group a target could be identified and marked to an accuracy of 45m (50 yards). It was found that the best results were achieved by diving from 914 to 304m (3,000 to 1,000ft). The first operation by 627 Squadron was a raid on La Chapelle marshalling yards on April 20, 1944. In many cases, the targets covered a relatively small area in occupied territories, so each end of the installation would be marked for the bombers to aim between. An example of this type of attack was on Usine Lictard at Tours, which had been left apparently undamaged by an American heavy bomber day attack. A British heavy bomber night attack was marked by 627 Squadron, the main snag being that the first marker went through the factory glass roof and could hardly be seen from the air; the factory was destroyed.

Another difficult target was a heavy gun at St Matin Varreville, which was so well camouflaged that it could not be seen from the air. However, its position was betrayed by a number of tracks leading to an empty space in a field, and the space was bombed, destroying the gun. A tragedy followed an attack on München-Gladbach on the night of September 19/20, 1944, when the Master Bomber Mosquito MkXX crashed in Holland under mysterious circumstances. The two crew perished, the pilot being 26-year-old Wg Cdr Guy Gibson, VC, DSO, DFC, leader of the dams raid.

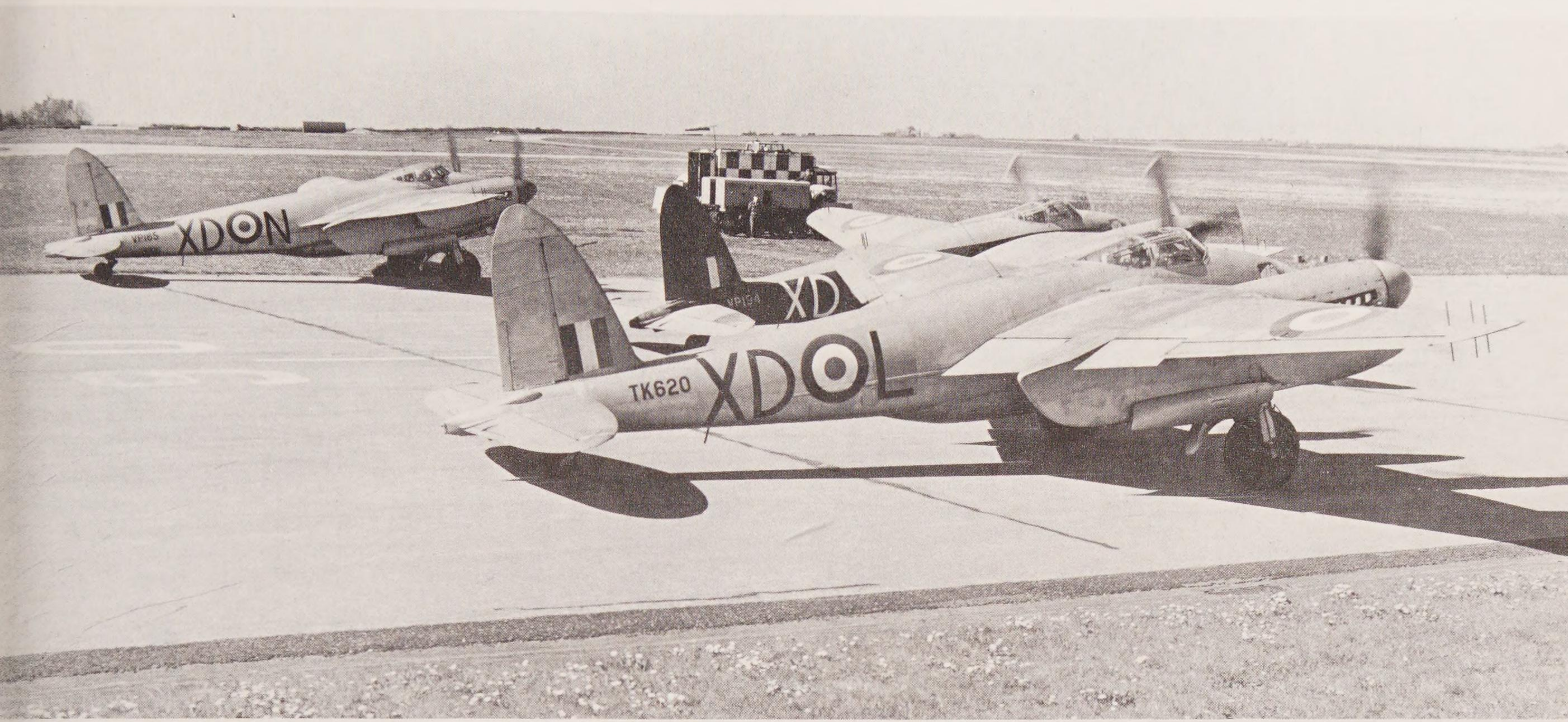
Target marking continued, examples being the Dortmund-Ems Canal, rail yards at Kaiserslautern, and the sea wall at Flushing. On the last day of the 1944 627 Squadron was given its own raid, a repeat attack on the Gestapo HQ in Oslo. As with the previous raid the route and target weather were bright and clear, despite the time of year. The Mosquitoes were to be over the target at mid-morning in two waves of six aircraft, each loaded with either two 1,000lb bombs or four 500lb bombs. The Leader was Wg Cdr G. W. Curry, and a mixture of B.IV and B.XX aircraft were used. The departure was about 09.30 from Woodhall Spa, the return being to Peterhead in the North of Scotland.

The flight across the North Sea was made at 2,133m (7,000ft), but a descent was made to 1,000-1,500ft on the approach to the target up Oslo Fjord. The leader's bombs were seen to drop on the target, bu the Germans had time to man their flak batteries and hit several o the aircraft, particularly in the second wave. The leader of this wave Flt Lt P. F. Mallender, found the area shrouded in smoke from th first attack, and ordered his crews to bomb only if they could see th target clearly. There were many people in the streets who had no had time to take cover. The target and some surrounding buildings appeared to be burning, and only one bomb-aimer of the secon wave was able to see clearly enough to drop a pair of 1,000lb bombs amongst the wreckage. No German fighters were seen, and all 1 aircraft landed at Peterhead, each having sustained some damage. Two were too badly damaged to return to their base.

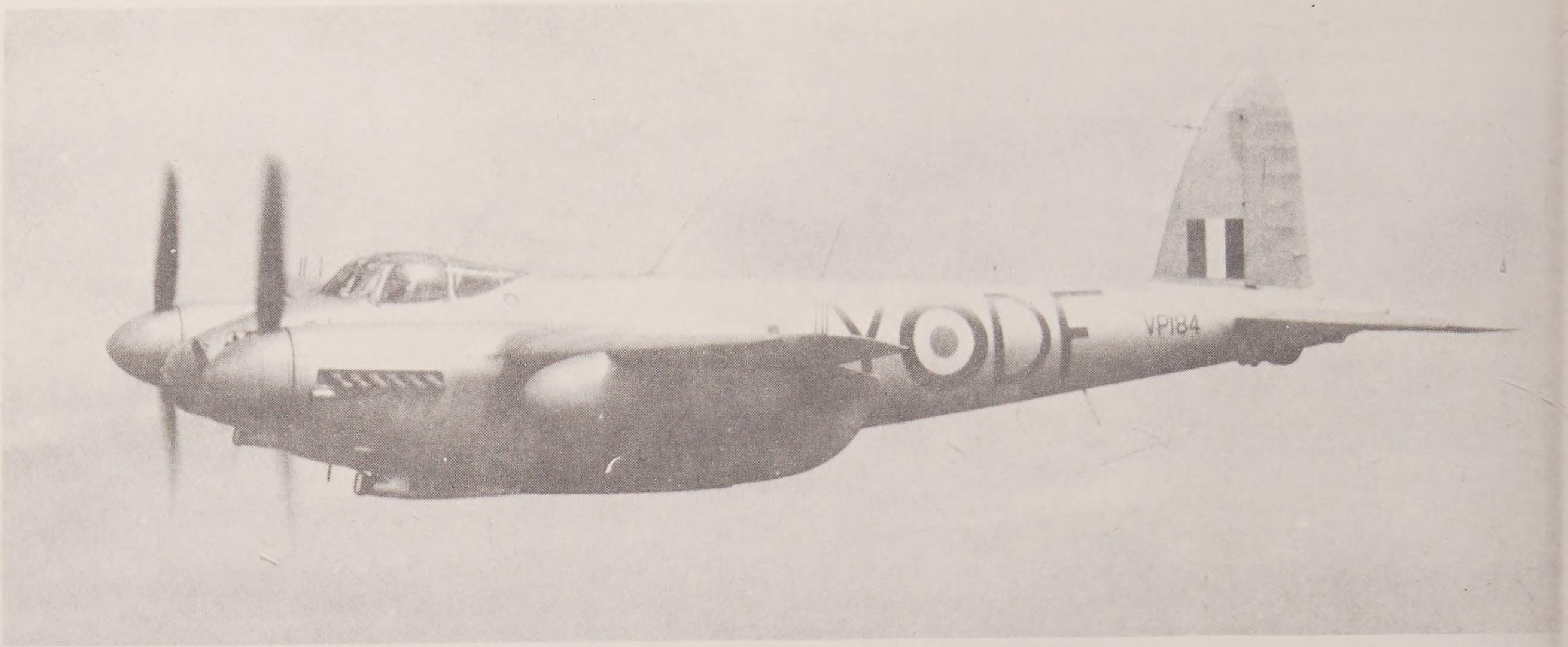
Unfortunately, the hits were not as accurate as had been hoped many Norwegian lives being lost as well as Germans. A tram full o people was completely destroyed by an almost direct hit, and many more civilians were buried in a four-storey building only 10m (33ft) from the target, which suffered a direct hit. German losses are no recorded, but they were certainly heavy, including about 60 in a hi on a hostel housing girls serving in the Luftwaffe. Surprisingly, th main part of Victoria Terrasse survived with only minor damage, but so worried were the Germans that they moved out to th suburbs, providing a great boost to Norwegian morale, despite thei losses.

To return to Pathfinding, 627 Squadron marked Dresden o

**The mock attack by Nos. 14 and 98 Squadrons at Farnborough on July 8, 1950 to commemorate the Amiens Prison Raid.**


XDON
VP185
XD
VP194
TK620
XDOL

Three B.35s of No. 139 Squadron ready for a formation take off from Hemswell in May 1950. *Flight*



**Airpseed built B.35 VP184 in service with the Central Bomber Establishment.**

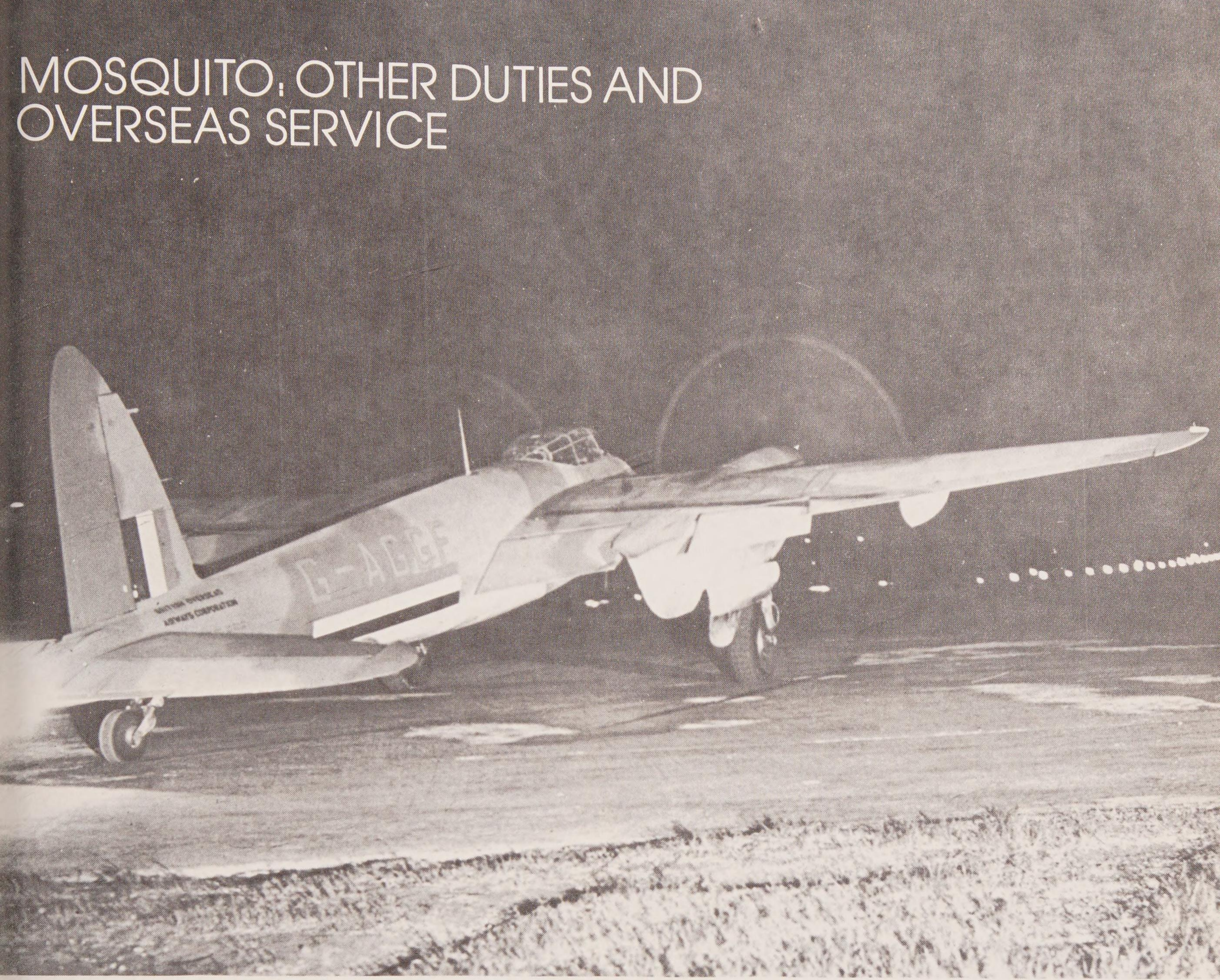
February 13, but with the reduction in targets the Squadron filmed and flew reconnaissance operations for 5 Group until the end of the war in Europe.

Jet-powered aircraft began to gain a foothold in the uneasy early days of peace, but the Mosquito continued in the bomber role until replaced by the Canberra in August 1952 (Canberras had first entered service a year before, with 101 Squadron). The final bomber version of the Mosquito was the B.35, the first of which flew from Hatfield on March 12, 1945, but entered service too late to see active service. The B.35s were issued to 109 and 139 Pathfinder Squadrons based at Hemswell, the sole Bomber Command units to use this version. 109 replaced their Mosquitoes with Canberras in August 1952, and 139 Squadron following suit in November 1953.

In Germany, 69 Squadron operated B.35s at Wahn until disbandment in November 1947. 14 Squadron also flew from Wahn, and 98 Squadron, based at Celle, in Germany, staged a mock attack at the RAF Display at Farnborough on July 8, 1950, to commemorate the Amiens Prison Raid of February 1944. Both of these squadrons replaced their "Wooden Wonders" with agile Vampires from the same stable in 1950-51.

So ended the active bombing career of "Freeman's Folly". Conceived as a bomber but used in other roles in far greater numbers, the Mosquito nonetheless achieved a number of significant successes as a bomber. It had led the elite Pathfinder Force and dropped all types of ordnance from all altitudes, in all weathers, by day and night. It had also regularly brought its two-man crews home safely to fight another day.

# MOSQUITO: OTHER DUTIES AND OVERSEAS SERVICE



**Mosquito Mk.VI G-AGGF ready for a night take off down the Leuchars flare path. This aircraft was lost on August 17, 1943 when it hit high ground, killing the crew.**

The Mosquito gained a fine reputation as an unarmed bomber and photo reconnaissance aircraft, fighter bomber and night fighter. For most aircraft that would have been enough, but this truly outstanding multi-role aircraft subsequently proved itself adaptable to a number of other duties which could never have been envisaged by its designers. The changes required for these roles were relatively minor, limited to what was necessary for satisfactory operation, and the airframe remained basically the same.

### The Mosquito Airliner

A most unlikely task for a high performance combat aircraft was its urgent adaptation as a communications aircraft to serve with the British Overseas Airways Corporation (BOAC), carrying urgent freight, documents, and even passengers between Leuchars in Scotland and Stockholm in Sweden. This service became known as the "Ball Bearing Run", because one of the most vital cargoes was ball bearings from Sweden to keep our industry alive. The Mosquitoes were unarmed, converted bombers with civil markings, flown by BOAC aircrews who used the high speed of the Mosquito to run the gauntlet of the enemy defences in Germany, occupied Norway and Denmark before reaching the safety of neutral Sweden.

These services started in 1942, using four Lockheed Hudsons and two Lockheed Lodestars to bring back downed Allied aircrew who had managed to escape to Sweden and Norwegians who had escaped from their own country and wished to continue the fight against their invaders. Other escapers used the hazardous North Sea route in boats of various sizes, taking the chance of missing the North of England and perishing in the Atlantic. Some urgent and bulky cargo was also brought across by sea.

Sweden was trading openly with both sides to maintain its neutrality, and the Allies not only needed the ball bearings for their factories, but sought to deny them to the Germans. When the Schweinfurt ball bearing factory was destroyed by the USAAF in mid-1943 the situation became critical and two Mosquitoes were rapidly modified to take a passenger each in the bomb bay. These two passengers were able to negotiate successfully for the entire output of Sweden's ball bearing factories, and thereby saved the day. The passenger accommodation was not to be a very high standard. They lay on a mattress at the rear end of the bomb bay in full flying kit, complete with oxygen mask, reading lamp and RT,

**A civilian BOAC crew who flew Mosquitoes on the ball bearing run from Leuchars to Stockholm.**

**Mosquito Mk.IV G-AGFV ex DZ411 was the first to be allocated t**
**BOAC and was delivered for crew training on December 15, 1942**

their only contact with the crew. In addition to all their flying gear, they were also provided with a parachute, so in an emergency they could drop out of the bomb bay. Although the flight was somewhat uncomfortable, the duration was only three hours, compared with nine hours of much higher risk in the slower aircraft.

The slower Hudson and Lodestar operations were risky, because they could only fly under the cover of darkness or cloud. This made operations impossible during the summer months, with their short nights, and hazardous during the winter due to icing and navigation difficulties. The Swedes also maintained their own links to Scotland with Dakotas, but any sign of special favour to either side was avoided by operating another service to Berlin. The position improved somewhat when the Allied victory seemed more certain. When the BOAC aircraft arrived at Bromma they were frequently parked next to the Deutsche Lufthansa Ju52/3ms, and the crews often had been friendly before the war. Generally it was only civil-registered and operated aircraft which flew these routes, as any military aircraft and crews would be interned by a neutral country. As noted in the chapter on Mosquito bomber operations, George Parry was the pilot of the first Mosquito to fly to Stockholm to collect photographs for the Oslo raid. This 105 Squadron aircraft, DK292, flew out on August 6, 1942, with all military markings removed and the crew in civilian clothes.

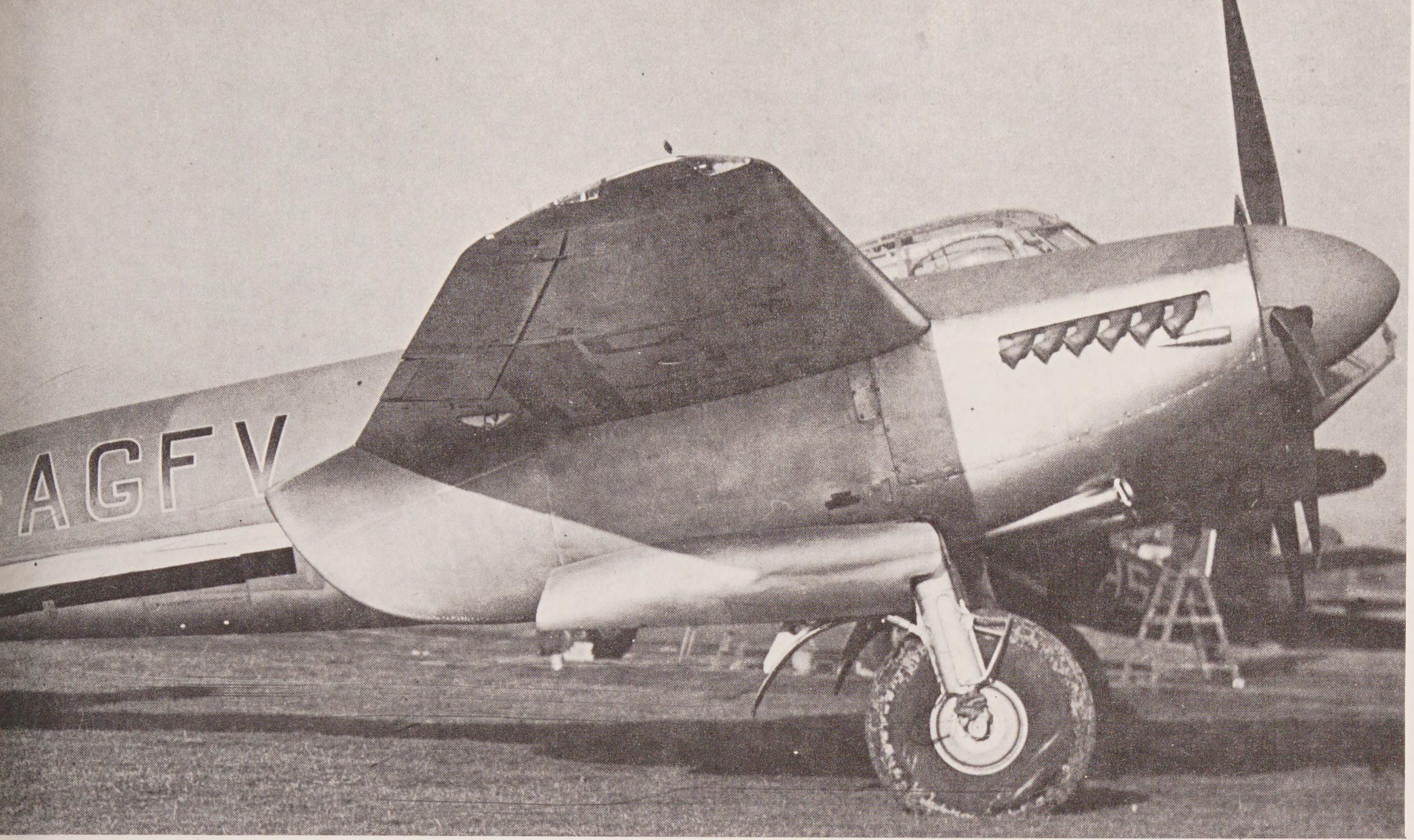
BOAC were offered Venturas, Hudson 3s, Merlin-powered Whitleys and an Albemarle to replace their earlier aircraft, but pressed strongly for Mosquitoes, especially after the run by the 105 Squadron aircraft. Fortunately their requirements were recognised, and B.IV, DZ411, was fitted with long-range tanks in the bomb bay and re-registered G-AGFV. It was delivered to BOAC on December 15, 1942, and flew its first sortie to Stockholm on February 4, the following year. On April 12, after a successful introduction, it was confirmed that six more Mosquitoes were to be allocated to BOAC, the selected aircraft being unarmed FB.VIs HJ690, '681, '718, '720, '721, and '723, which were registere
G-AGGC to G-AGGH respectively. These aircraft were delivere
between April 16 and May 2, 1943, but the slightly faster MkIV wa
always favoured by the crews.

Despite their speed the Mosquitoes were not immune to enem
attack, and on the night of April 22-23, 1943, G-AGFV was badl
damaged by an FW190 while flying over the Skagerrak and had t
belly-land in Sweden. It was not repaired until December, bu
fortunately the MkVIs were just about ready to carry on the service
With the Mosquitoes committed to this route, all other BOA
aircraft were withdrawn from the Stockholm run. The appearanc
of the new aircraft intensified enemy flak and fighter activity.

During the season of the midnight sun, in the summer months
the Mosquitoes were usually able to complete the trip without to
much trouble, despite some hair-raising chases by the enemy. Th
initial losses to aircraft and crews were due to accidents rather tha
enemy action. On August 17, 1943, the senior pilot, Capt Wilkins
took off from Leuchars in G-AGGF but soon after radioed that h
was returning. That was his last message, and no more was hear
until the wreckage was found by a gamekeeper on September 8. Th
aircraft had hit high ground at 762m (2,500ft) on the approach i
bad weather, and Capt C. N. Pelly took over as leader of th
operation.

The second loss occurred on October 25, when G-AGGG crashe
about a mile short of Leuchars after struggling most of the way fro
Sweden with the port engine failed. Both crew, who were ex
Norwegian Air Force officers, were killed along with thei
passengers.

In the winter months of 1943/44 there was an urgent need to fly 9
tonnes (90 tons) of machinery and cargo to Britain, but only 3
tonnes would fit into the Mosquitoes. BOAC therefore put Dakota
and a Liberator on the route to collect the bulkier items, but ba
weather caused a great deal of delay to the programme. Withou
reliable advanced notice of weather conditions flights were held up
so Mosquito MkIV G-AGFV was used as a pathfinder, to investi



gate weather conditions and transmit back to base one of two pre-arranged code letters advising whether conditions were suitable or not with regard to weather or threat of German defences. With its greater endurance, the MkIV could fly to within 161km (100 miles) of Bromma and still have enough fuel to return home if necessary.

With the arrival of the lighter summer months, Mosquitoes were again used exclusively on the Stockholm run, and three more MkVIs were supplied in the spring of 1944 to replace the lost or damaged aircraft. These were HJ667, LR296 and HJ792, re-registered G-AGKO, 'KP and 'KR and delivered to BOAC during April. Three T.IIIs were also allocated for crew training during the overall period of the service, but they retained their RAF identities as they were only used locally. In June 1944 a record number of 42 sorties was flown and 151 were made during the summer period between May and August. It was during August that two of the new MkVIs were lost in mysterious circumstances. G-AGKP came down in the sea 14km (9 miles) off Leuchars, killing the two crew and another of the pilots, Capt Orton, who was travelling as a passenger. G-AGKR failed to arrive from Goteburg on the night of August 28-29 and no trace was ever found.

On November 3 it was decided to stop the flights to Scandinavia, as the Allies were now advancing rapidly across Europe, although eight further trips were flown before the final suspension on November 30. One round trip was made in February, and the services were resumed briefly on April 12, 1945. The Mosquito service finally ceased on May 17, 1945, and a move was made from Leuchars to Croydon, where three of the remaining MkVIs were handed back to the RAF on June 22. The first of the MkVIs, G-AGGC, remained with BOAC until it was eventually returned to the RAF on January 9, 1946. In most cases the returned aircraft were stored in maintenance units for a while until disposed of as scrap. A total of 520 successful round trips were made by Mosquitoes, occasionally carrying famous people as passengers, averaging about nine single trips per week for two and a quarter years. Several Mosquitoes and crew made three single trips in a night, and a total of eight crew members and two passengers were killed during the operations.

### Mosquito Electronic Counter-measures

A little-known duty of the Mosquito was early Electronic Counter-measures (ECM) work, which began with what was known as the Blind Approach Training and Development Unit (BATDU). This Unit was re-formed on June 13, 1940, to locate and bend the German Knickebein beams, which were used to guide their bombers in a similar manner to our Gee. Rumour had it that the distortion of the beam was so successful on one occasion that the Luftwaffe bombed Dublin. The unit originally operated Ansons and Whitleys, and in October 1940 it became the Wireless Intelligence Development Unit (WIDU). On December 10, 1940, the unit was absorbed into 109 Squadron, when it was equipped with Oboe Mosquitoes. Before commencing operations, the aircraft were used on "Ferret" flights noting enemy radar frequencies, radio messages etc. They also helped in the development of Oboe and tested Window.

When 109 Squadron became operational 1473 Flight was formed from the Squadron's "A" Flight on October 7, 1942, to carry on the trials work, and was based at Upper Heyford. Moves were made to Finmere, Felwell, Little Snoring and Foulsham. Mosquito DZ377 was one of the aircraft recorded with the Flight, which is believed to have become part of 192 Squadron in February 1944. 192 Squadron was formed from 1474 Flight on January 4, 1943, their three Mosquito IVs operating from November 1942. They had apparatus installed to detect enemy radio and radar transmissions to over 3,000 m/cycles. It took many months for the crews to train for the operations, which commenced with DZ410 from Feltwell on June 11, 1943, and continued throughout the rest of that year and 1944, the aircraft flying over Germany without even dropping a bomb. Right up to the end of the war 192 Squadron continued its specialised secret duties, another of which was to jam the enemy AI radar transmissions.

**Meteorological Mosquito MkIX of 1409 Flight landing at Wyton in November 1944, after its 153rd sortie.** *Crown Copyright*

## Mosquito Weather Reconnaissance

Before contemplating any form of flying, one of the basic rules is to check the weather along the route to be flown. In these days of satellite reporting and contacts along the route and at the destination the weather can be predicted with a reasonable degree of accuracy, but during World War Two these aids were not available. Knowledge of weather conditions was critical, as it could make the difference between locating the target or possibly aborting the mission at a late stage, when many aircraft were airborne and wandering around lost in a hostile sky. Meteorological flights were therefore essential to bring back vital weather information shortly before a planned raid.

No 1401 Flight was formed at Bircham Newton in August 1941, within Coastal Command, to perform sorties with the code name PAMPA. The unit was initially equipped with two Spitfires, but in April 1942 these were replaced by a pair of Mosquito B.IVs, one of which flew the first PAMPA sortie by the type on July 2. On August 1 the Flight became 521 Squadron. Most flights penetrated deep into enemy territory to gain target information for the night raid, but in November 1942 a met. sortie code-named "RHOMBUS" was flown out over the North Sea. With the transfer of this work to Bomber Command in early 1943, 521 Squadron was disbanded on March 31 but replaced by 1409 Flight at Oakington the next day. Operations using MkIV Mosquitoes commenced on April 2, and the replacement of the earlier aircraft started on May 21, when the first Mosquito MkIX was delivered. Despite their high speed there were a number of unexplained losses which could either have been due to enemy action or the deplorable weather in which they often had to fly. So that they could be nearer Group Headquarters a move was made to Wyton on January 8, 1944, when Mosquito MkXVIs started to replace the MkIXs.

For nearly three years the Mosquitoes flew in the worst weather conditions ahead of each planned bomber raid, reporting back on cloud bases and visiblity, sometimes in conditions which would almost seem impossible for flying. They also had to fly deliberately through icing conditions to bring back reliable information. While doing this is was essential not to reveal the planned target to the enemy, and put him on his guard. The crews had to be trained in meteorological theory, and several cameras were carried as well as the special instrumentation. These Mosquitoes were always on standby, and as well as obtaining weather information to help in the planning of raids, they also flew ahead of King George VI and Sir Winston Churchill to keep a watch on the weather.

Derek Smith was a young Pilot Officer with 1300 Met Flight in the Far East in 1946. He had trained on Tiger Moths and Harvards in South Africa in the Empire Air Training Scheme. On returning to Britain to learn how to fly in European weather conditions, he was posted to 13 OTU at Middleton St George on Mosquito FB.VIs, in anticipation of a posting to the 2nd TAF in Germany. However, he had a chance of a posting to Asia on unspecified duties, and he rapidly accepted. On arrival in Singapore he was given the choice o flying Beaufighters or Mosquitoes, and chose the latter. He was posted to Mingaladon near Rangoon to join four other crews, and found he was to fly weather patrols. Not having flown for some time he had to refamiliarise himself with the aircraft, flying off the narrow runway with its monsoon ditches down either side. One of his colleagues, who was also trying to get his hand in, managed to write off three aircraft in as many days by swinging into ditches, and was posted away before they ran out of aircraft.

Their task was to report the weather conditions for the transpor aircraft flying to the far east from India across the Bay of Bengal Each sortie lasted about three hours, being flown on a triangula course from first light every day. They would transmit back three times an hour using Morse, giving details of cloud, winds, temperature and humidity. Normal operating height was 2,438m (8,000ft), the height at which the transport aircraft flew, but at each turning point a descent was made to sea level and a climb up to 6,096m (20,000ft). The main problem was the inter-tropical front with the monsoon, which was off Rangoon from March until September. Following the bad weather a move was made to Butterworth for the other six months of the year to report from there.

Despite the improved glue, the constant high humidity and temperature took its toll of aircraft. Every 28 days or so the inspection panels were opened up around the main spars, and if a feeler gauge could be pushed into the joint the aircraft would be written off. Replacements were no problem, as there were ample stocks of Mosquitoes in Asia, many of which had hardly been used.

Derek Smith had one memorable incident, when he had an engine failure while on a met. flight from Butterworth. He was out over the sea and as usual the weather was bad. When he returned to base a violent thunderstorm was in progress, and even overflying at 91m (300ft) showed up no hope of landing. Derek flew out to sea again to wait for the storm to clear. A Mosquito on one engine should ideally have been at 457m (1,500ft) and the flaps should not have been lowered until the last moment. Derek was already at 244m (800ft), and could not open up too much on the live engine for fear of losing directional control. Fuel was running low, so he decided to have another try at getting in and was instructed to try from the landward end. However, he could see nothing, and suggested he might land on the beach, now being resigned to a wheel-up landing. Then he realised his speed had dropped too low, so he had to make an immediate landing. Seeing the seaward end of the runway sticking out at the end of the storm, he came down on to the runway with the wind. The aircraft came to a gentle halt on the wet runway and was repaired to fly again. One of his colleagues later flew a Mosquito for a safety film and misjudged the approach, unintentionally crashing in full view of the cameras. The aircraft was smashed to pieces by rocks and trees, leaving only the strong cockpit intact with the crew safe.

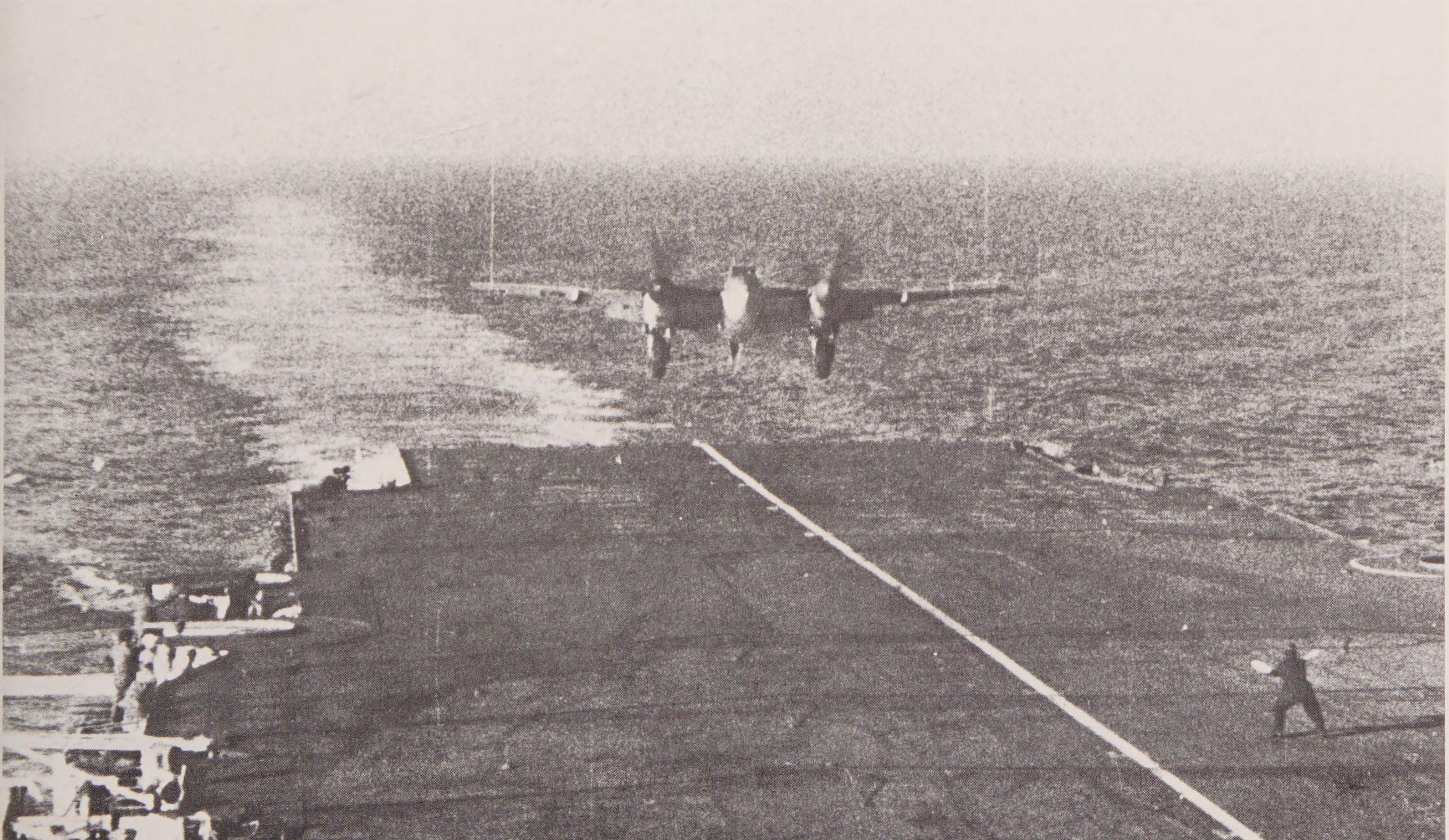
In Britain after the war 1409 Flight continued obtaining weather information using Mosquitoes, eventually transferring to Transport Command and taking up residence at Lyneham. A Mosquito PR.34 flew with the Meteorological Research Flight from 1952 to 1955, while in June 1957 other Mosquitoes replaced Spitfires at Woodvale on the civilian-operated THUM (Temperature and Humidity) Unit. These flights involved flying to a regular point over Worcester at 09.00hr GMT daily and recording readings at various altitudes. Notes were also made on cloud formation, visibility, icing, contrails, isothermals and the prevailing weather. Soon after the Mosquitoes took over these flights ceased and the Mosquitoes were retired.

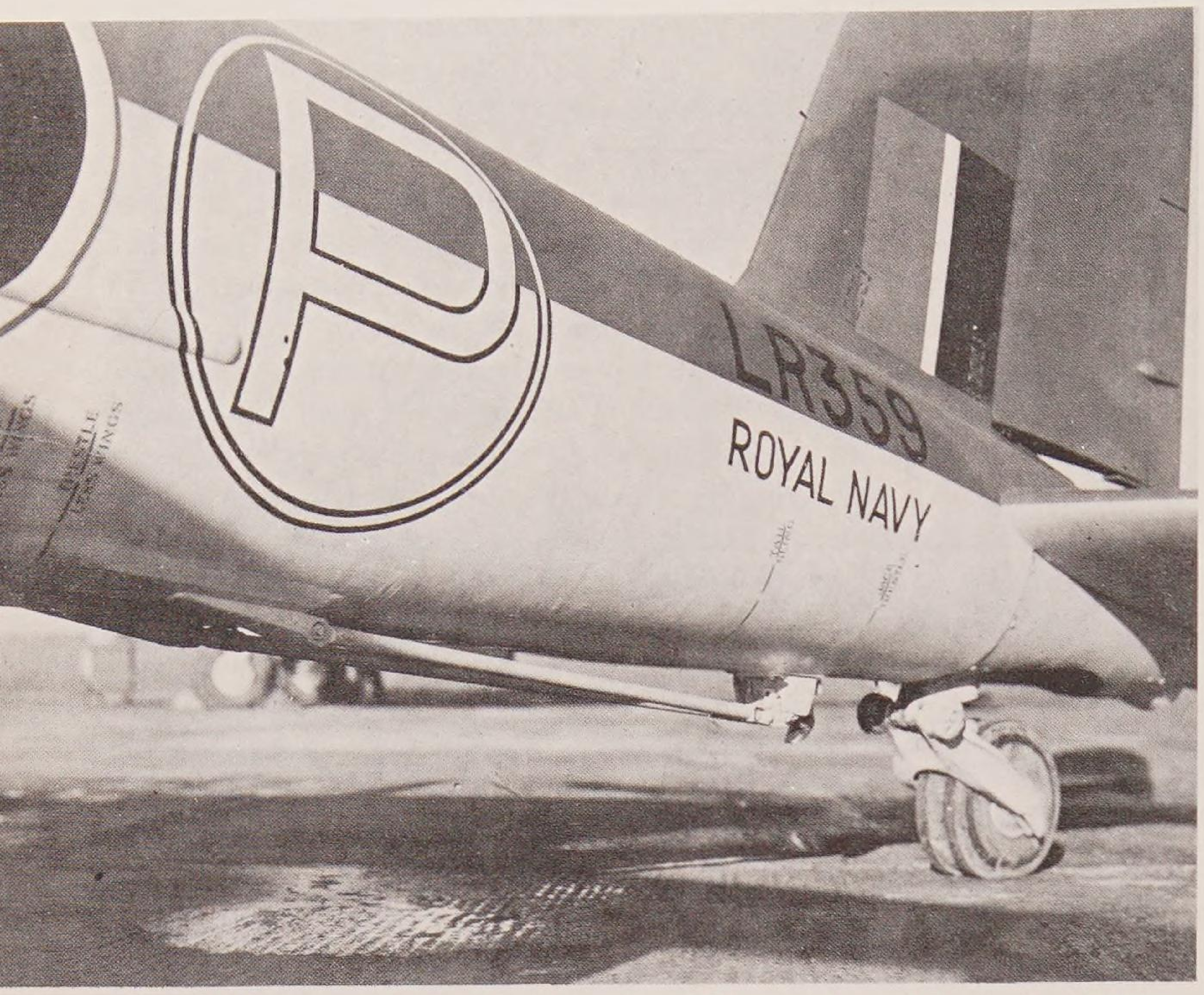
## Mosquito Naval Operations

In addition to its many other achievements, the Mosquito was the first twin-engined aircraft to operate from the deck of an aircraft carrier. The first deck landing of this comparatively large aircraft was made on March 25, 1944, by Lt Cdr Eric "Winkle" Brown, who landed a modified MkVI, LR359, on HMS *Indefatigable*. There were a number of worries prior to this landing. Was the landing speed of 200km/hr (125mph) too high for carrier work? With its propellers turned by powerful Merlins, would the aircraft be very difficult to keep straight? Before making his attempt to land on the carrier's small deck, Winkle Brown flew the aircraft to establish the lowest stalling speed and also practised on a strip of runway marked out to represent the flight deck. To allow the wing to clear the island superstructure, the aircraft had to be offset with the starboard engine over the deck centre line, and the well-sprung undercarriage could cause the aircraft to bounce over the arrester wires.

The Mosquito was fitted with a Fairey Barracuda-type arrester hook, attached to a specially strengthened rear fuselage, but did not have folding wings. Further practice landings were made at Arbroath and the nearby East Haven airfield. Then the day for the

**The first deck landing by a twin engined aircraft was by Mosquito LR359 on March 25, 1944 on HMS *Indefatigable.* It landed to one side to avoid the wing hitting the island.**





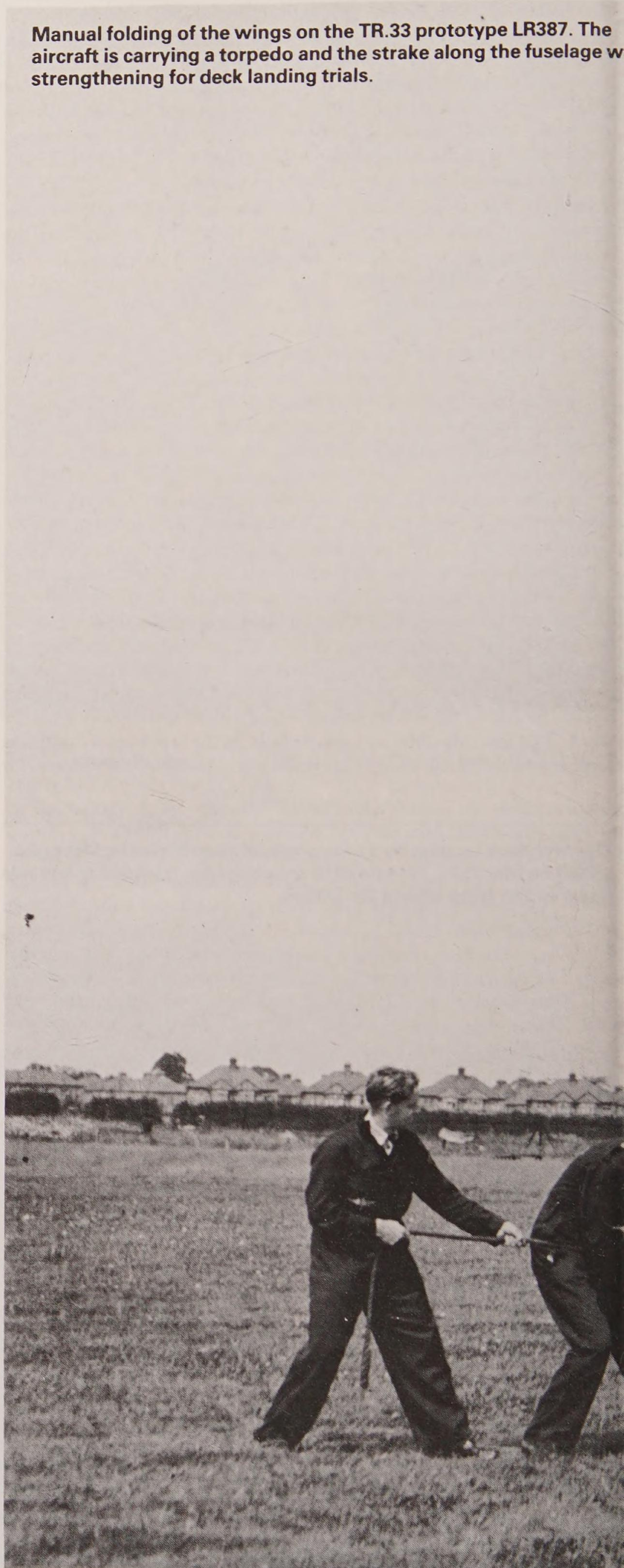
**The 'A' frame arrester hook on the RN prototype Mosquito LR359.**

first proper carrier landing arrived, with all the VIPs on the carrier to watch the results.

Turning for his approach about a mile and a half astern of the ship, which was steaming in ideal conditions off the Scottish Coast, Commander Brown had an excellent view of the deck. His plan was to touch down at 136km/hr (85mph), and the engine throttles were open, the propellers in fine pitch, and flaps and hook down. Expertly guided by the batsman, he eased back the throttles over the roundown and came to a gentle halt, arrested by the second wire. The aircraft was found to have touched at a mere 125km/hr (78mph), at a weight of 7,257kg (16,000lb).

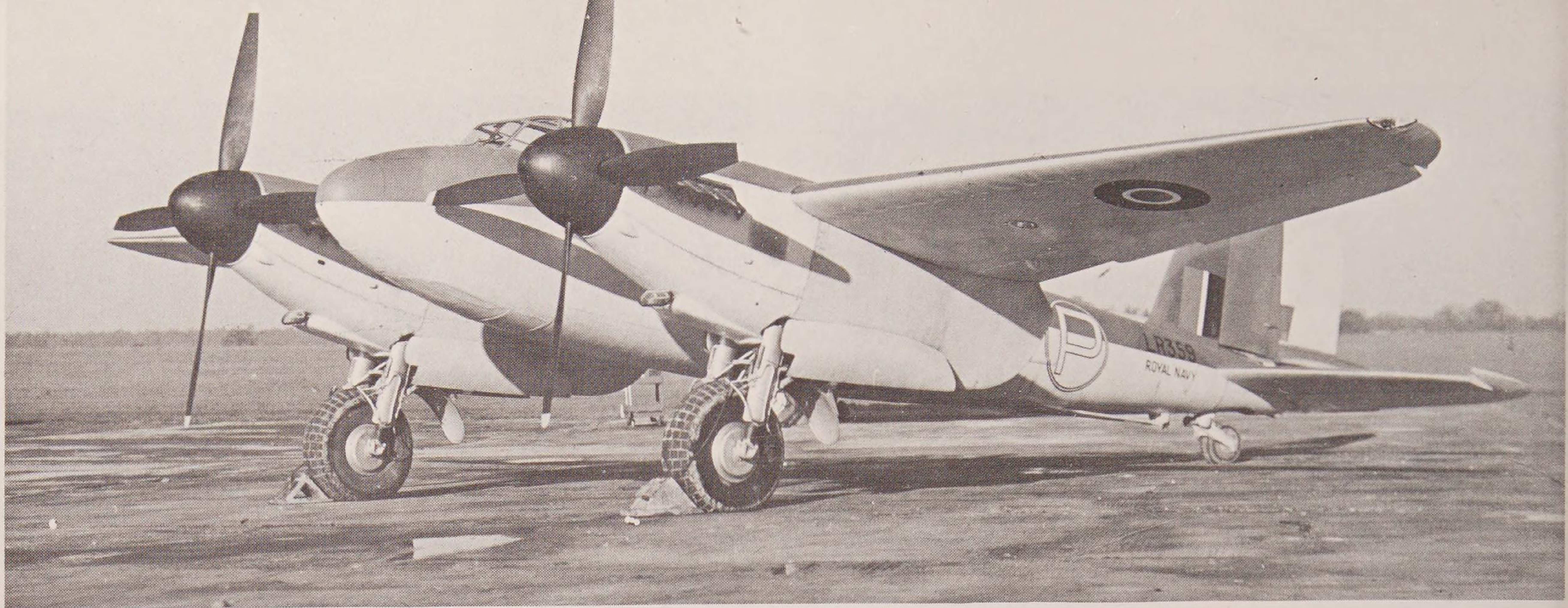
After a thorough check the Mosquito took off again, the high wind over the deck helping to give the rudder enough power to counteract the expected swing. The next day, a further three landings were planned at gradually increased weights from 7,620kg (16,800lb) to 7,711kg (17,000lb) and finally 8,165kg (18,000lb). The first two went smoothly, but on the third the extra weight caused hard deceleration on picking up the wire. There was a sudden lurch and the aircraft careered alarmingly up the deck. Commander Brown had to make a rapid assessment of the situation. Had the arrester wire broken, had the rear fuselage broken off, or had the hook broken? If it was either of the first two, then it was best to stay aboard, but if it was the latter, the only answer was to open up and take off again. This of course would be disastrous if the tail was no longer attached. He opened up so quickly to gain speed that the aircraft began to swing to port, fortunately away from the island, and as the Mosquito was already on one side to clear the superstructure the aircraft soon began to leave the side of the deck. It sank towards the water, but recovered just ten feet above the waves and climbed away with a somewhat numbed crew to land eventually at Macrihanish. The claw at the end of the hook had failed, and a strengthened one was put on by de Havillands at Hatfield. On a later deck landing, another pilot missed all the arrester wires and came to a halt inches from the bows with his brakes completely burned out.

The Naval requirement outlined in Specification N.15/44 resulted in the TR.33, based on the RAF FB.VI and fitted with manually folding wings, "A" frame arrester hook and local struc-

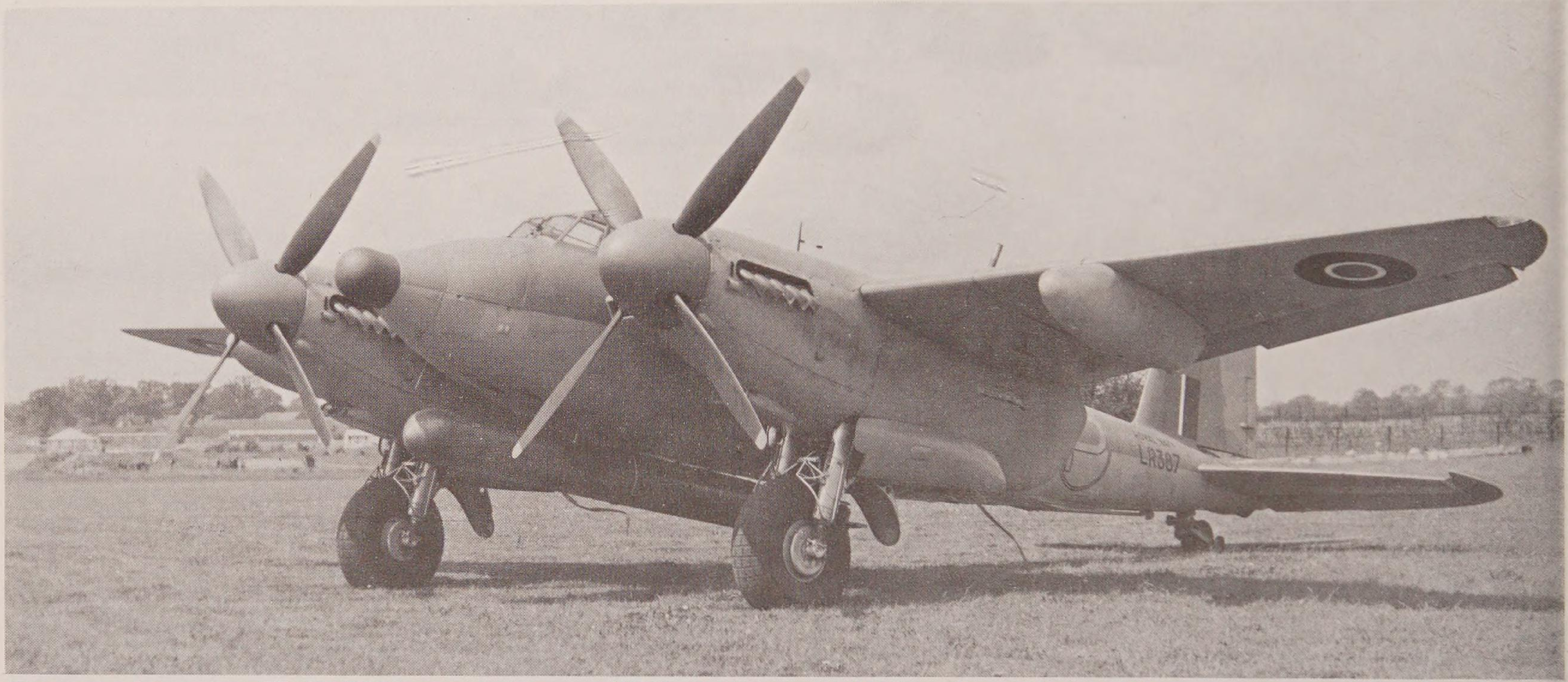


**Manual folding of the wings on the TR.33 prototype LR387. The aircraft is carrying a torpedo and the strake along the fuselage w strengthening for deck landing trials.**

DH
MOSQUITO
DH
MOSQUITO
IMPORTANT
LOCK DOOR UNDER
BEFORE FLIGHT

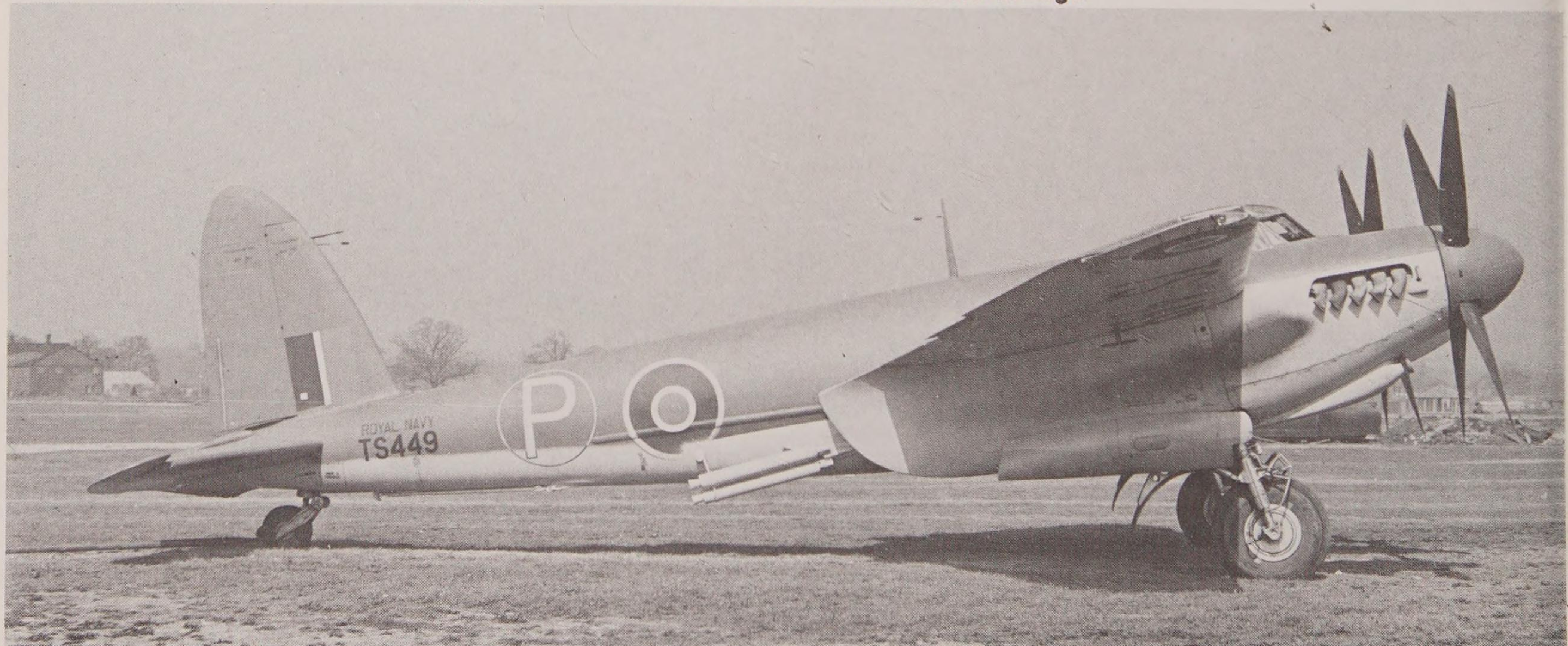

LR359
ROYAL NAVY
P

LR359, the naval conversion of a MkVI without folding wings used on the deck landing trials.



The second prototype TR.33 LR387 converted from an FB.VI, and fitted with folding wings, thimble radome, arrester hook and four blade propellers. A torpedo is slung under the belly.

The second of two pre-production prototype TR.33s TS449 fitted with RATOG under the fuselage.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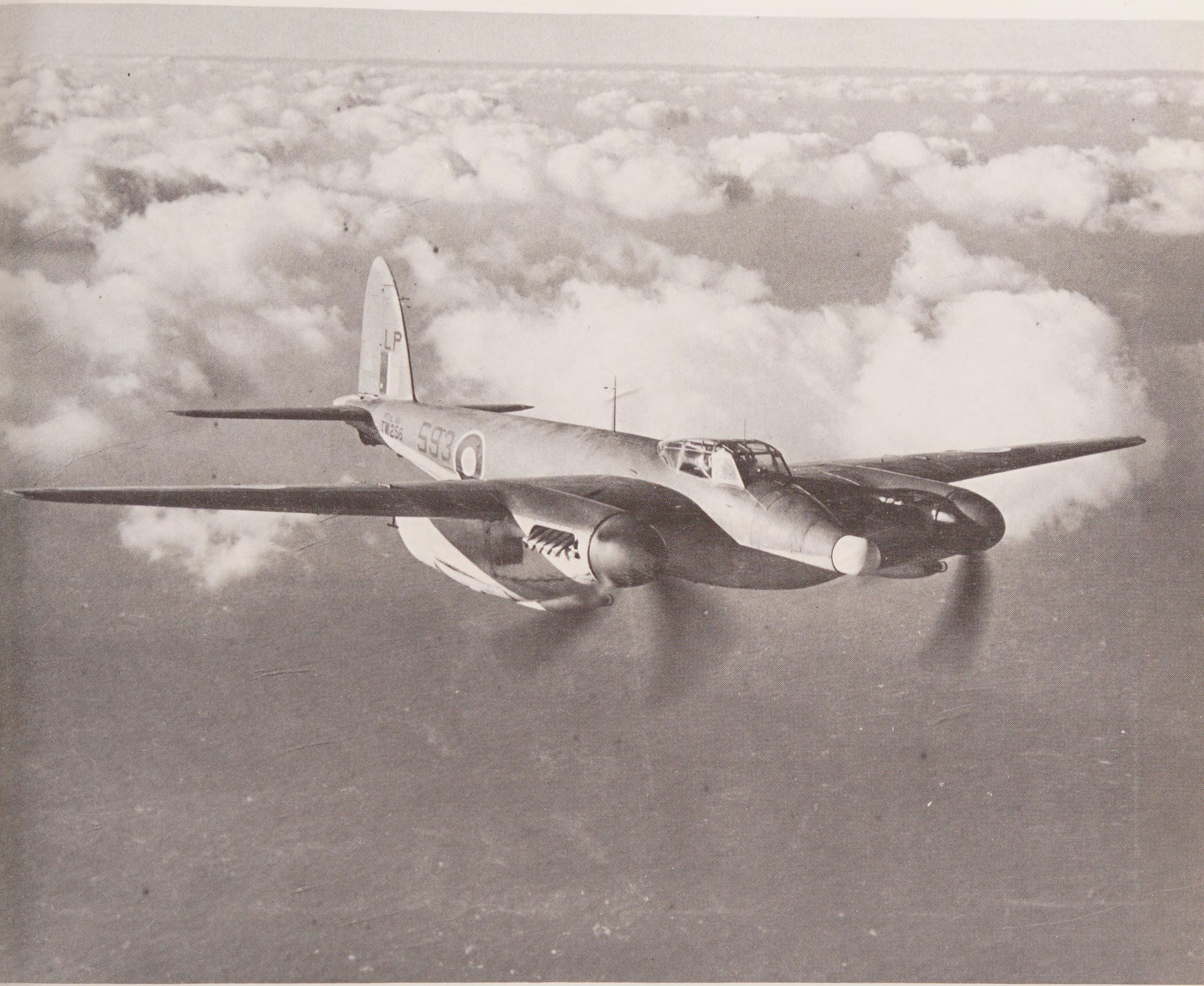


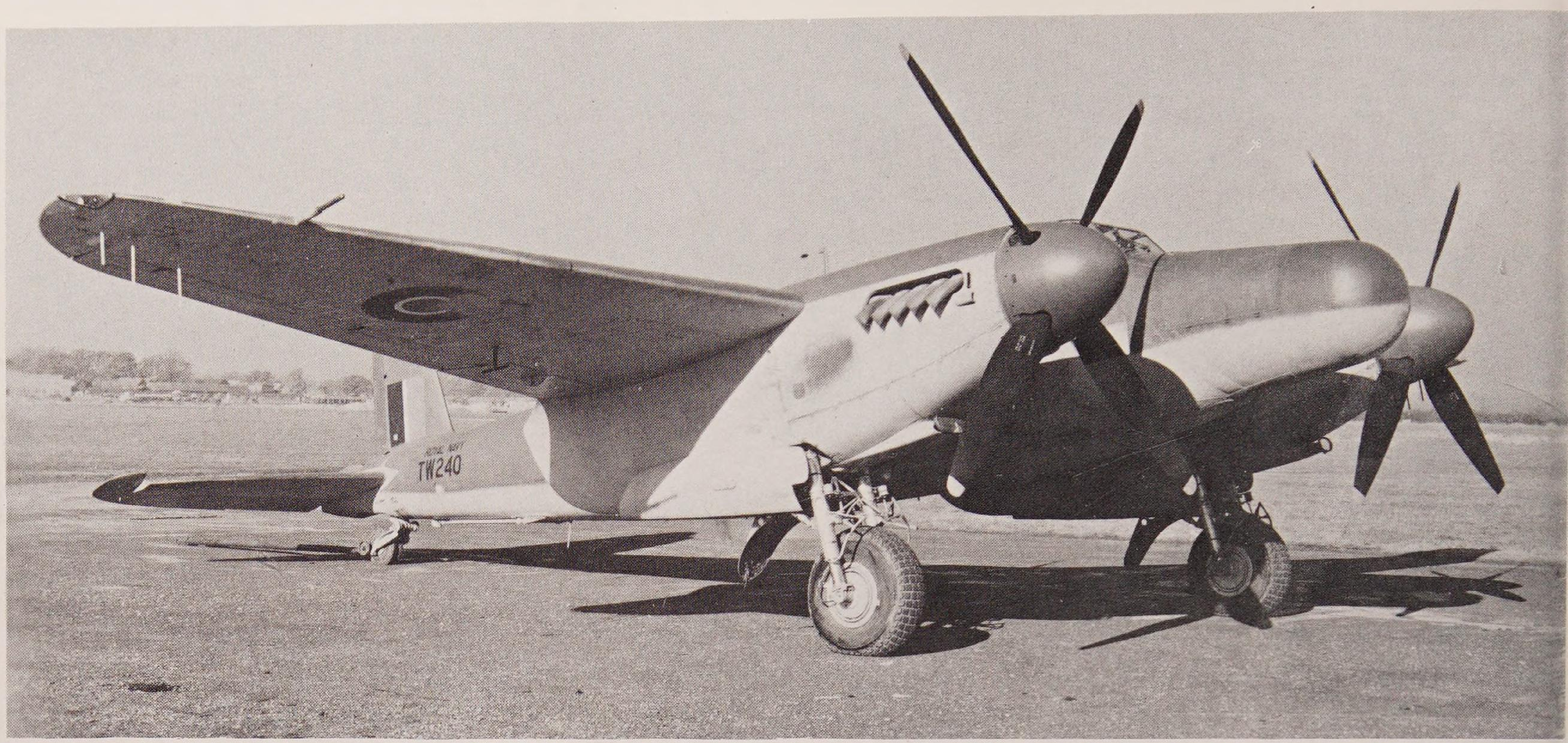
**Production TR.33 TW256 in service with the Fleet Air Arm.**
*Charles E. Brown*

tural strengthening. The Rolls-Royce Merlin .25 engines drove four-bladed propellers with the diameter increased to 3.8m (12ft 6in).

The prototype conversion was carried out on FB.VI LR359, which retained its non-folding wings, but the second prototype, LR387, had upward folding wings. Manual folding was used to avoid a lengthy and complicated re-design of the hydraulic system, which in the basic aircraft was very simple. However, the rubber-in-compression undercarriage was quite unsuitable for deck landing, owing to the bounce at the high landing speeds, so a Lockheed pneumatic design was substituted from the fourteenth production aircraft onwards. In the nose, the four machine guns were replaced by American ASH radar in a thimble radome, but the four 20mm cannon were retained. Two 500lb bombs could be carried internally, as well as the usual FB.VI underwing loads. Alternative loads which could be carried beneath the fuselage were one 18in torpedo, a mine, or a 2,000lb bomb. To persuade this heavily-loaded aircraft to leave the deck of a carrier, jettisonable Rocket Assisted Take Off Gear (RATOG) could be attached to the rear fuselage. Following the two prototype conversions two more development aircraft, TS444 and TS449, were built at Leavesden, followed by 50 production aircraft. A further 50 were ordered and then cancelled.

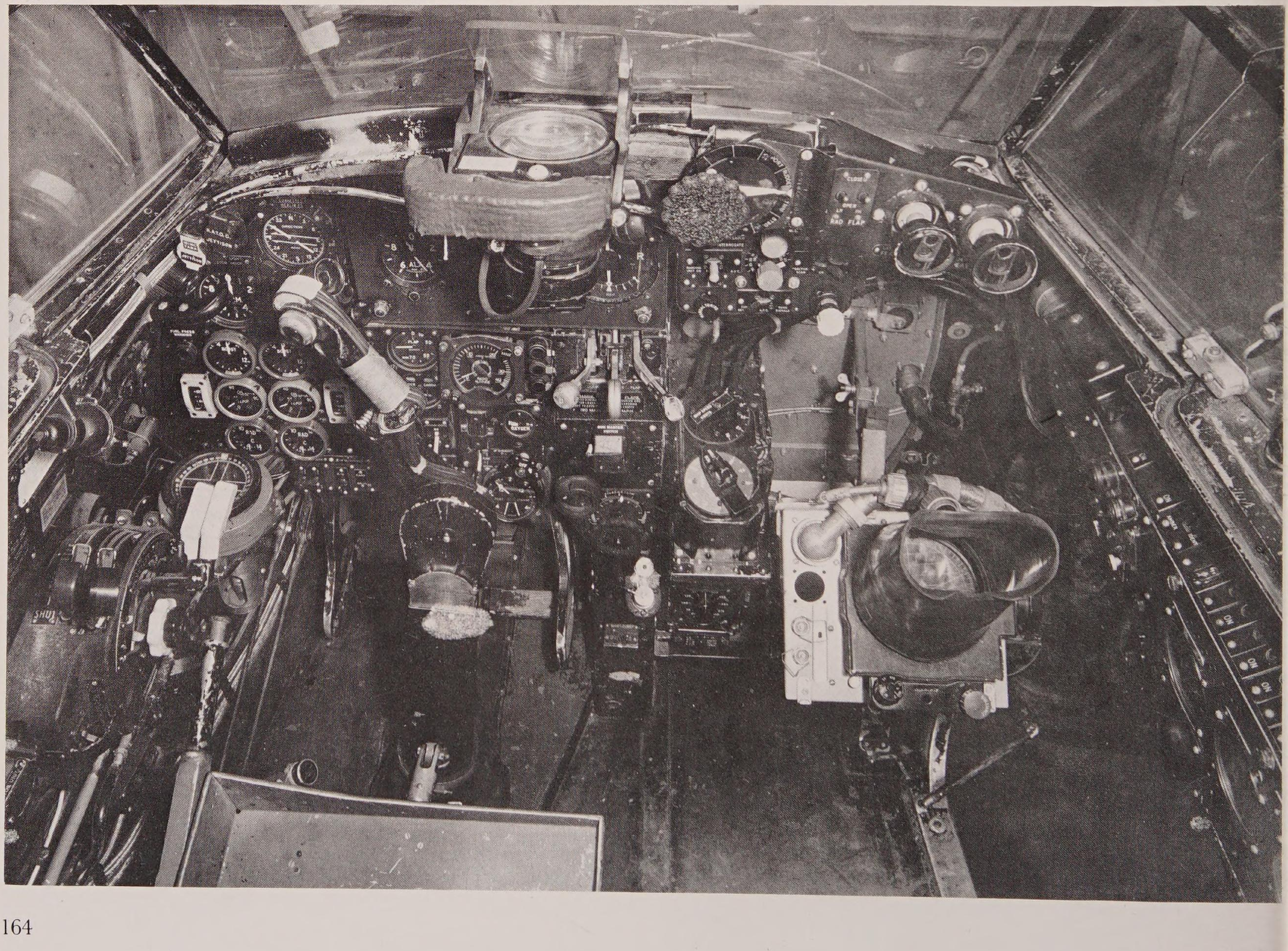
The first Royal Naval Mosquito unit was 811 Squadron, which received the first of 15 MkVIs at Ford in September 1945. The first TR.33 arrived in August 1946, and in January a move was made to Brawdy in South Wales, where the unit disbanded in July 1947. A number of second line training units with the Fleet Air Arm also used Mosquitoes, examples being 771 Squadron at Lee-on-Solent, 772 Squadron at Arbroath, 762 Squadron at Ford, 778 Squadron and 790 Squadron, the last aircraft being withdrawn in 1950.

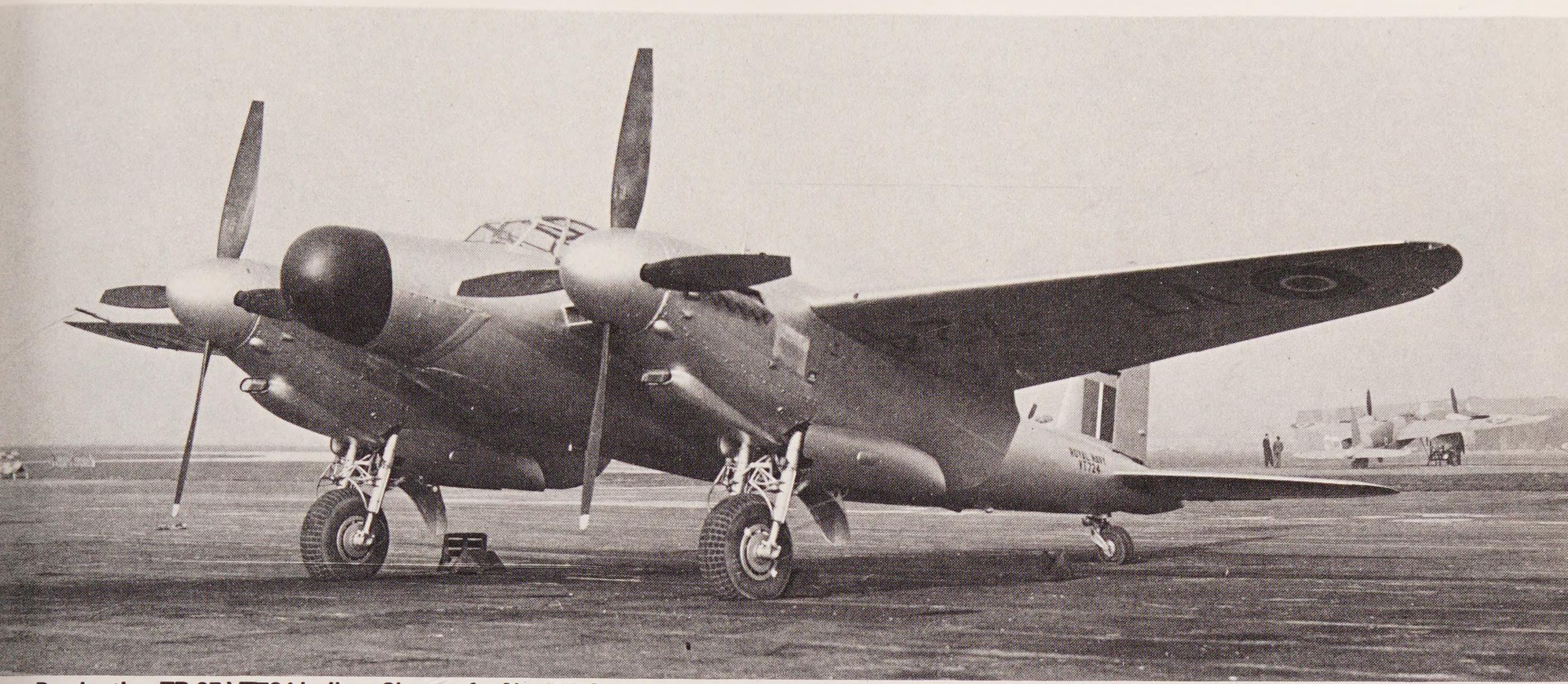
Two of the TR.33s were used for the "Highball" bouncing bomb trials and its post war development. In the mid-1950s 14 of the surplus TR.33s were denavalised and overhauled for the Israeli Air Force.



**Prototype TR.37 TW240 converted from a TR.33. The new hydraulic undercarriage is evident, and the new radome houses ASV Mk.XII.**
*Crown Copyright*

**The TR.37 cockpit had the radar operator's scope on the starboard side of the cockpit. The reflector gun site is in the centre at the base of th windscreen.**





Production TR.37 VT724 built at Chester for No. 703 Squadron.

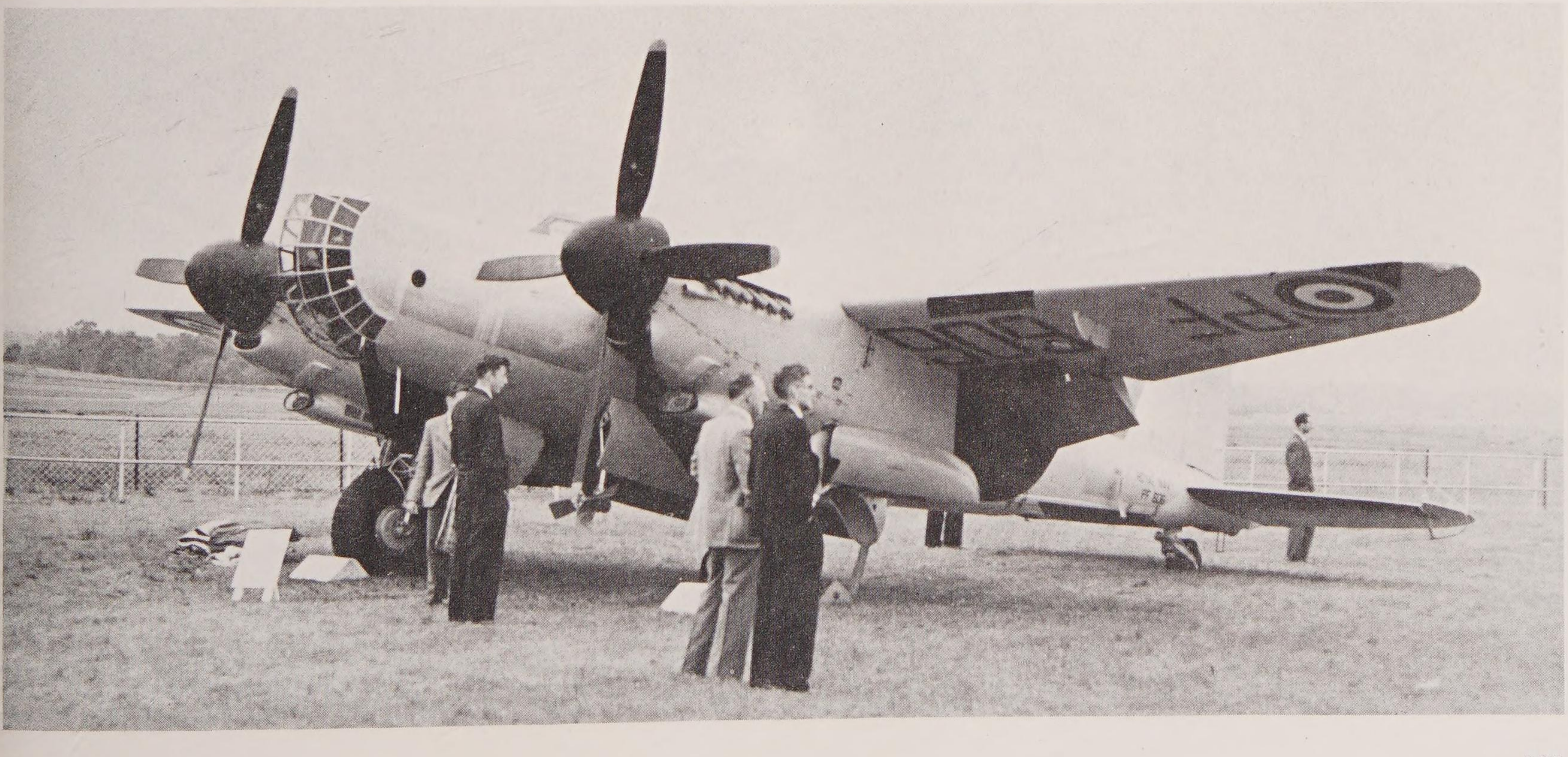
One TR.33, TW240, was fitted with British ASV MkXII radar in place of the ASH radar, under a larger nose radome, but was otherwise similar to the earlier version. This version became the TR.37, of which 14 were built at Chester for use mainly by 703 Squadron.

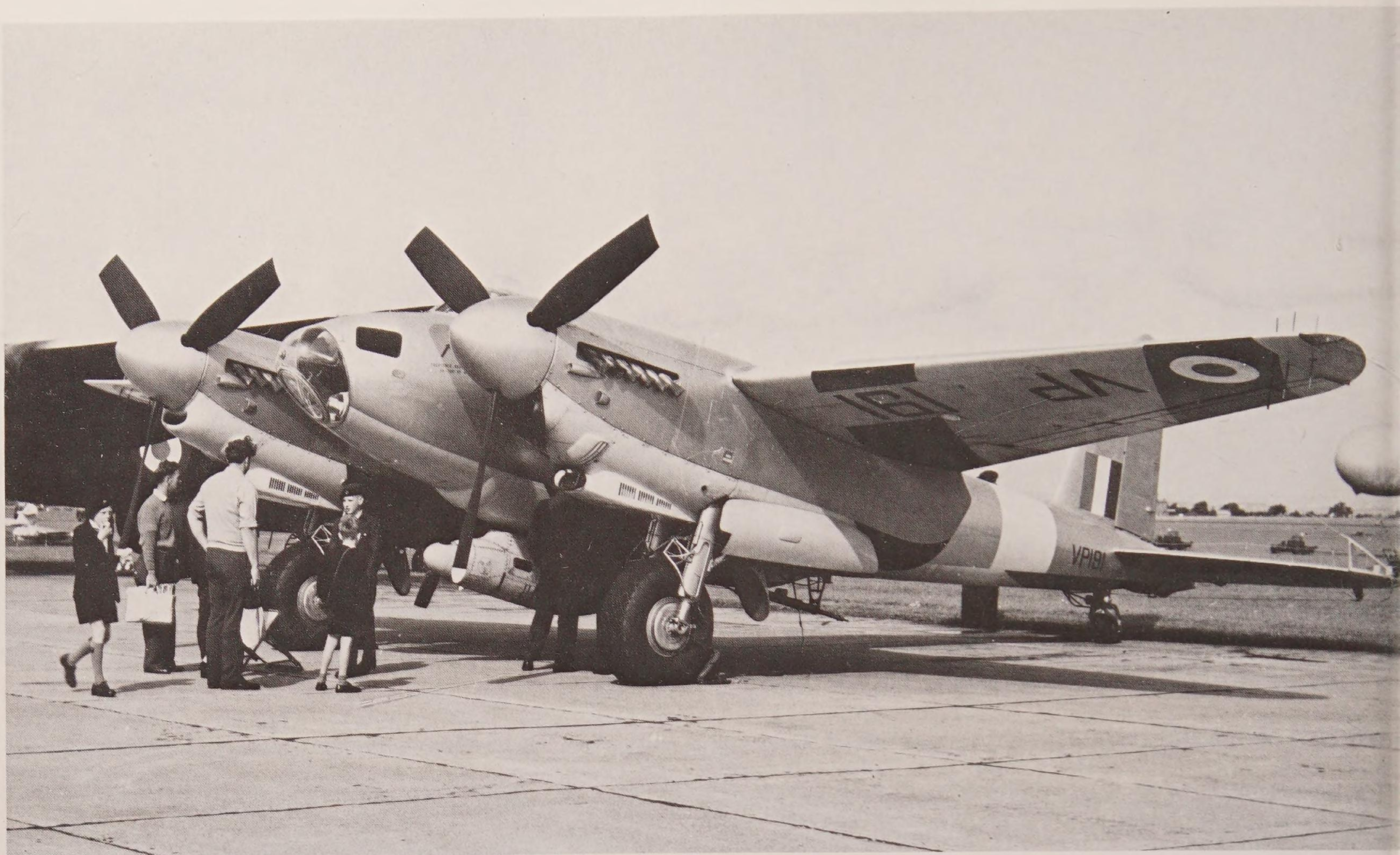
## Target Tugs

The final duty for the Mosquito was the rather mundane task of towing targets for gunnery practice. There is no record of the aircraft being adapted as a drone to become the target. One of these target-tug versions was operated by the Royal Navy with the designation TT.39. It was the ugliest Mosquito adaptation and the responsibility of General Aircraft Ltd, who had the task of converting a number of B.XVIs to Specification Q.19/45. To provide accommodation for two more crew members, an upward-curved, glazed nose was fitted for a camera operator, and a drogue winch operator was housed beneath a cylindrical perspex dorsal turret over the trailing edge of the wings. Powered by two Merlin 72/73 engines, the maximum towing speed was 483km/hr (300mph) and the propeller blades were clipped to give adequate clearance from the wider nose.

This variant was designed as a target tug and a gunnery target, the camera operator recording the intended miss distance – no doubt a rather unwelcome task for the crew. It could also be used for radar calibration exercises. Two prototype conversions were

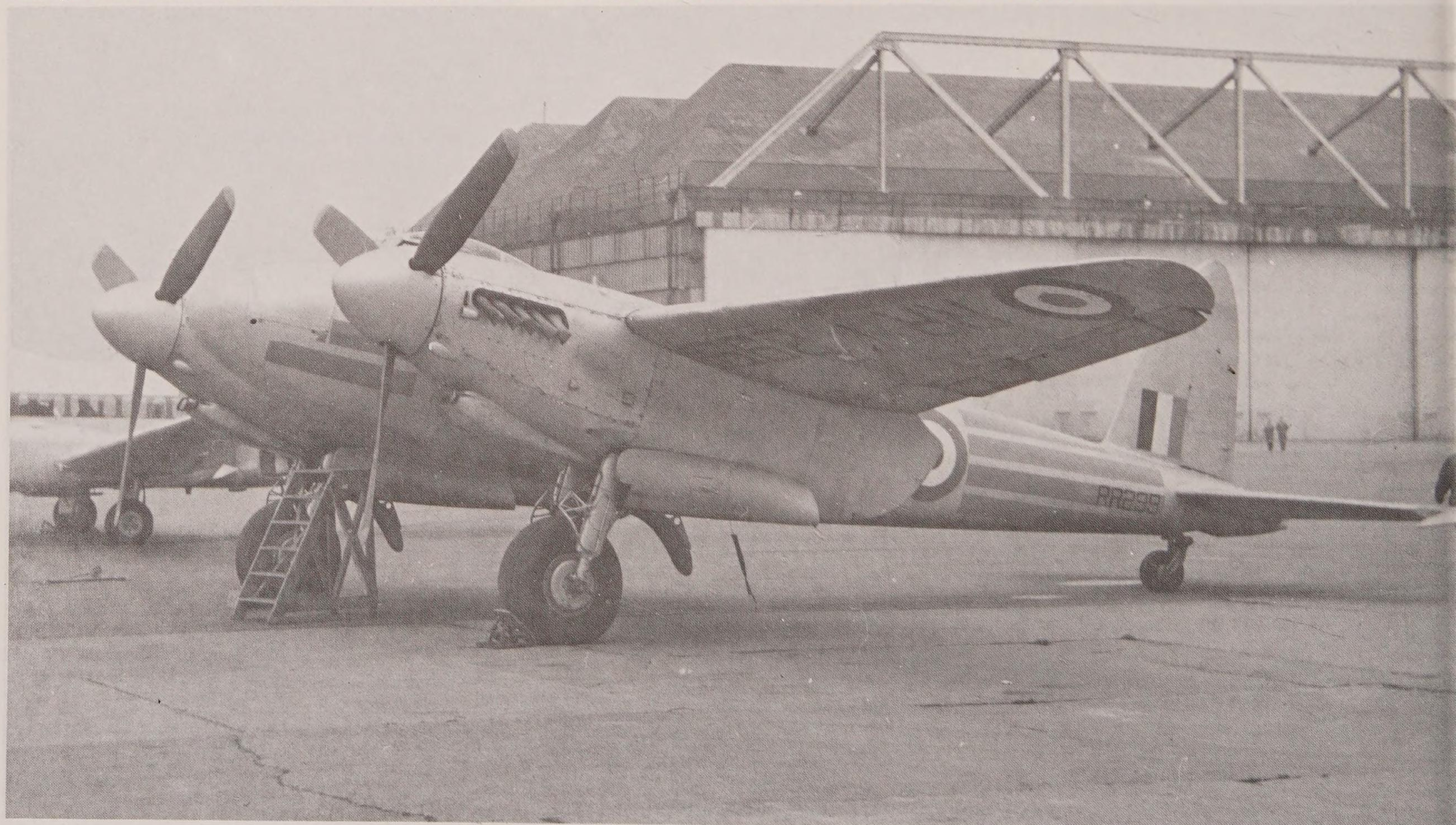
Percival built MkXVI converted to TT.39 with a new ugly nose, and yellow and black diagonal stripes on the undersurfaces.

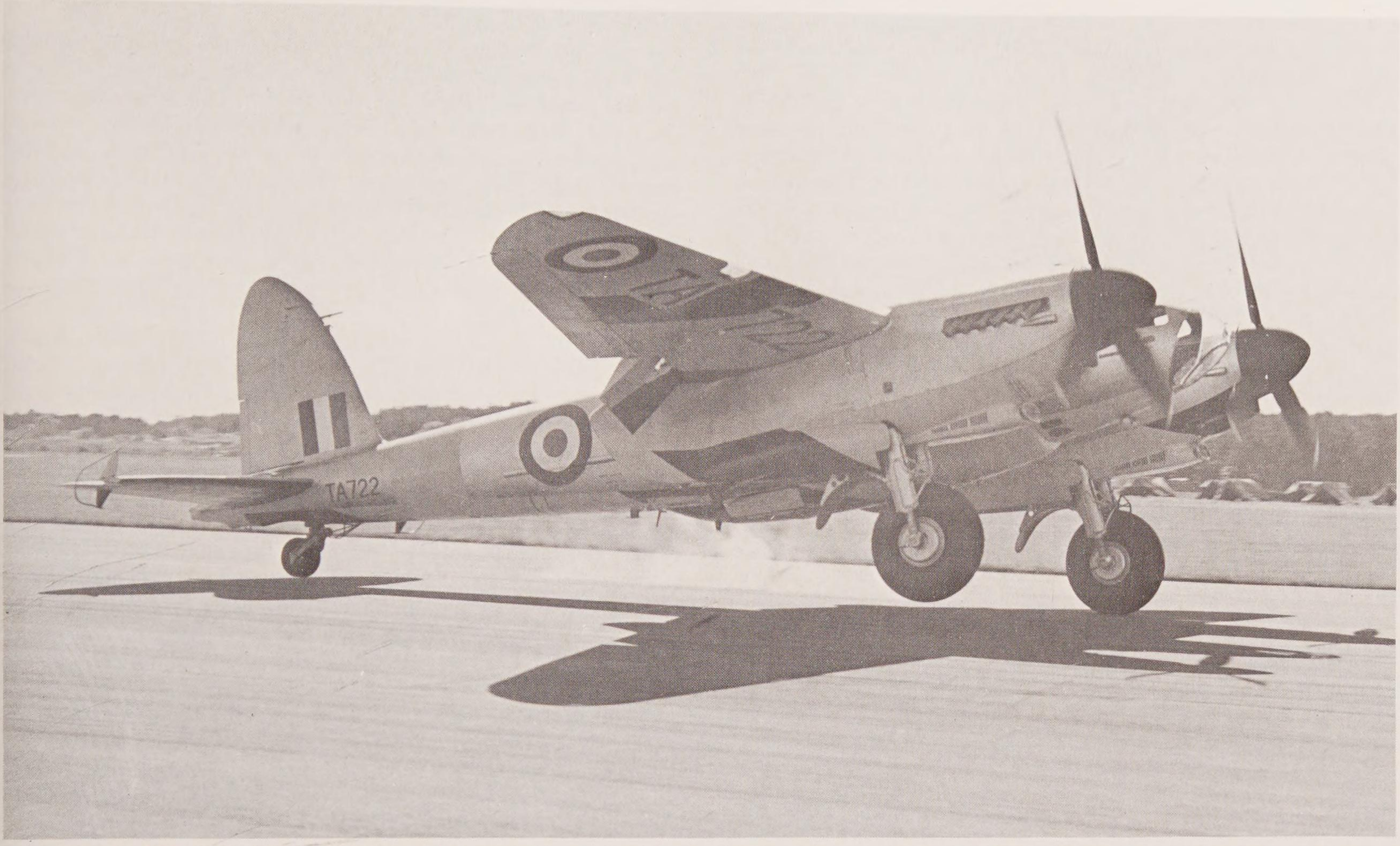




TT.35 VP191 of 3CAACU fitted with the underbelly winch and cable guards.

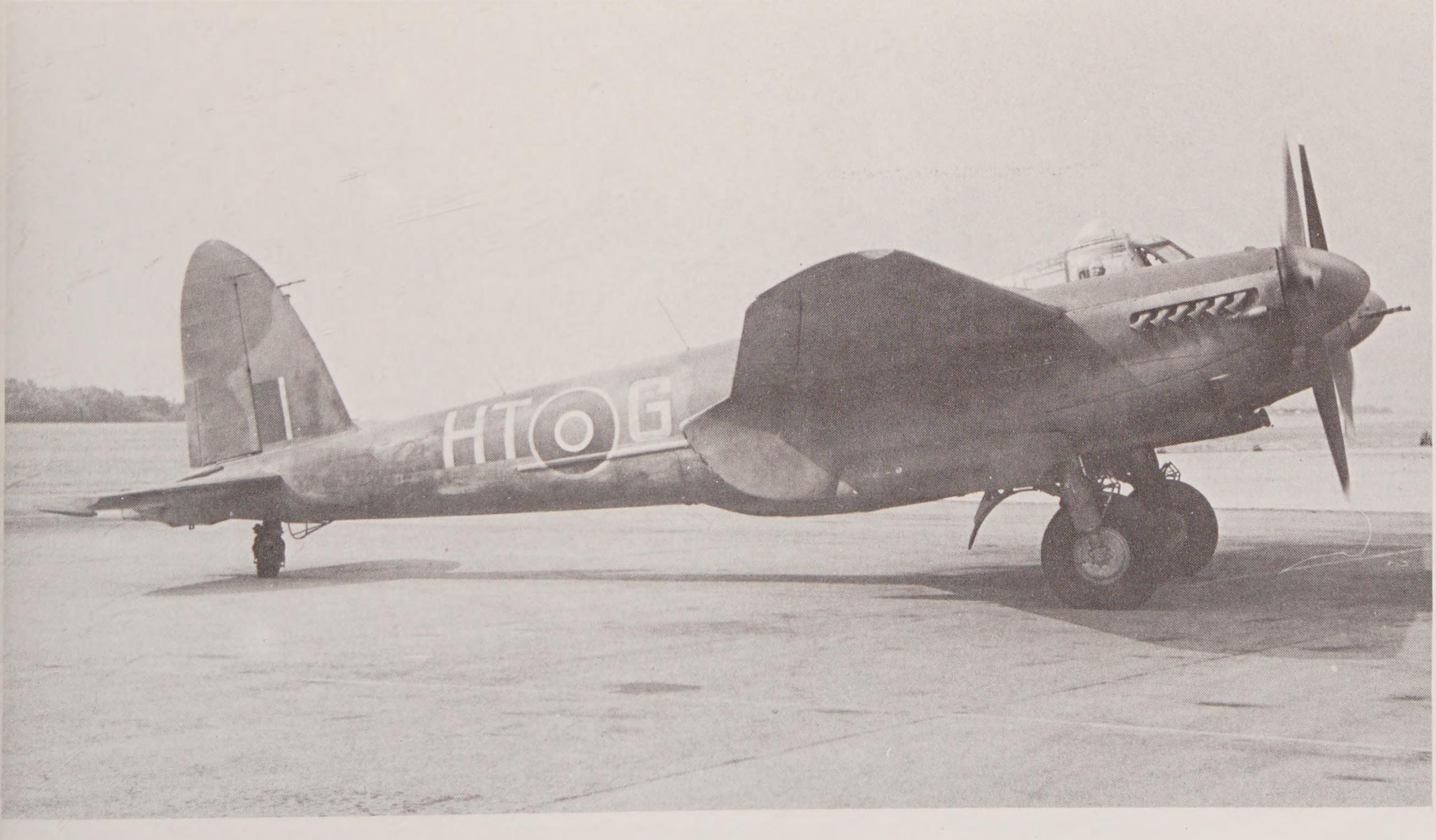
Mosquito T.III TT299 shortly after delivery to Chester in July 1963 from 27 Maintenance Unit Shawbury.





Mosquito TT.35 TA722 of 3CAACU, but with the winch removed; the drogue was dropped through a hole in the rear of the bomb bay. *Flight*

Mk35 TA634 at Bovingdon on July 5th, 1968 for the filming of *Mosquito Squadron* and now preserved at the Mosquito Aircraft Museum.



followed by 24 production conversions. These served with the home-based Fleet Requirements Units and 728 FRU in Malta from 1948 until their retirement in 1950.

When the Canberra jet bomber entered service a number of Mosquito B.35s were held in MUs in good condition, but were surplus to requirements. It was therefore decided to convert some to TT.35 configuration for target towing. A number of these aircraft served in RAF Germany for gunnery practice, but the main user was the civilian-operated No.3 Civilian Anti-Aircraft Co-operation Unit (CAACU), under contract to the Air Ministry to provide target training hitherto undertaken by the RAF and RN. In addition to about a dozen TT.35s, two T IIIs, RR299 and TW117, were used for pilot conversion and instrument rating. The former is now kept airworthy by British Aerospace and the latter is displayed in the RAF Museum at Hendon. The 3 CAACU Mosquito operations commenced in January 1953, providing target practice for Army and Navy gunners at the ranges off the south coast of Britain, from Portland to Cardigan Bay. The 4½-5hr endurance of the Mosquito was far superior to that of the jet powered Meteor which replaced it, which could fly for just over an hour.

In the summer of 1963 the Mosquitoes were retired, most of the 3 CAACU surviving aircraft being moved to Bovingdon, in Hertfordshire, for use in the film *633 Squadron*. Some studio shots used the remains of time-expired aircraft, and three others were destroyed during the filming. Four survived to be preserved. A sequel, *Mosquito Squadron,* was filmed at Bovingdon five years later using three surviving airworthy Mk35s and the T.III now operated by British Aerospace. Fortunately the crash sequences for the previous film were used, so all the aircraft survived.

## Mosquitoes for Export

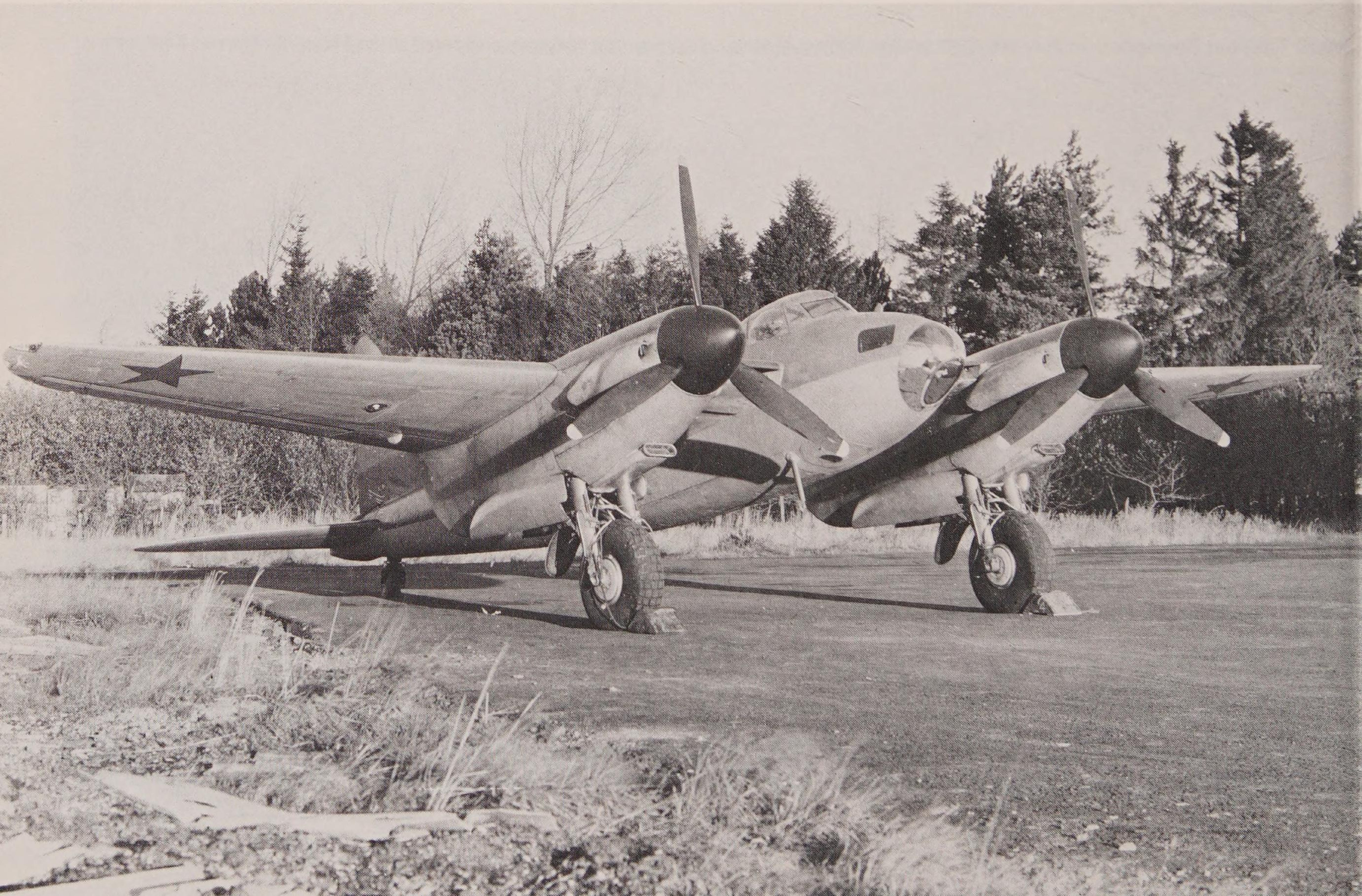
In addition to the overseas production of Mosquitoes in Australia and Canada many were delivered to other countries, either to provide additional combat aircraft for Allied air forces during the war or to help rebuild peacetime strength as interim postwar equipment before the advent of modern jet aircraft. During the war, aircraft could only be spared once production had built up sufficiently to equip all the home-based units. One of the more unusual deliveries was a batch of B.IVs to Russia. Mainly ex-RAF combat aircraft, these were withdrawn from storage in late 1943 and were accepted in August 1944, but there appears to be no record of their service or fate.

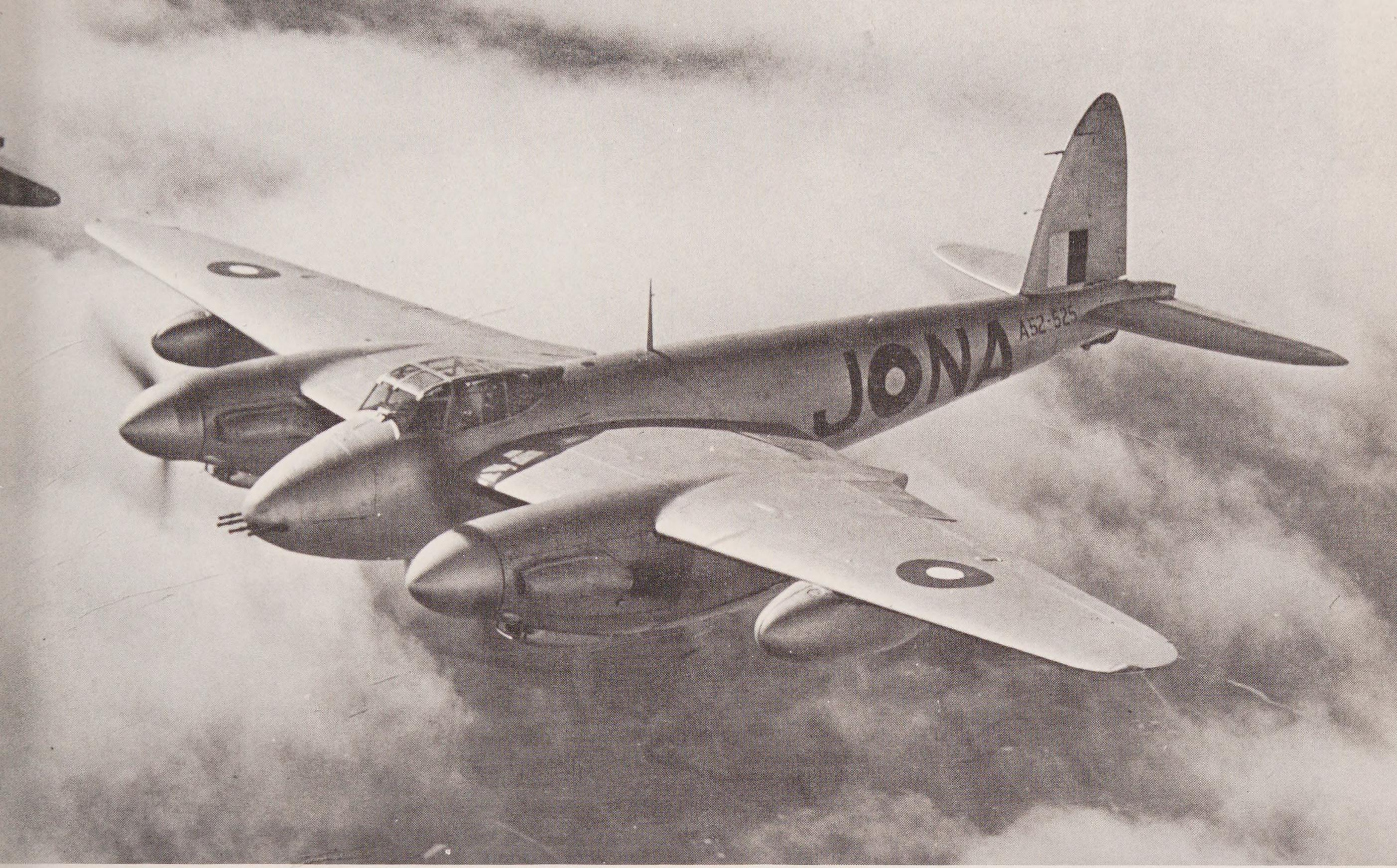
In Australia, Mosquito Mk40s were used by 1 Squadron RAAF against the Japanese from bases in the Halmaheras and later in Borneo. Their proudest task was as to escort to the Japanese General Yomanura when he was flown to surrender to the Allies.

Amongst Australian units equipped with Mosquitoes were 87 and 94 Squadrons, whose last aircraft were withdrawn from service in 1954. Four T.43s and FB.40s were transferred to New Zealand for the RNZAF, joining a number supplied direct from Britain. On December 10, 1946, the first ten of 80 Mosquitoes left Britain for New Zealand on their delivery flight, covering 18,990km (11,800 miles) in twelve stages in a total flying time of about 60hr. Fifty of the aircraft were reconditioned ex-RAF aircraft, the remaining 30 being newly-built. The South African Air Force Mosquitoes have been covered already.

On January 10, 1947, the first of 137 FB.VIs and T.IIIs were handed over to the Turkish Air Force by Fairey Aviation, who had prepared them for delivery at Ringway. The Royal Swedish Air Force ordered 60 NF.XIXs in 1948, to serve as interim night fighters with the F.I. Wing at Vasteras. All were ex-RAF aircraft, also

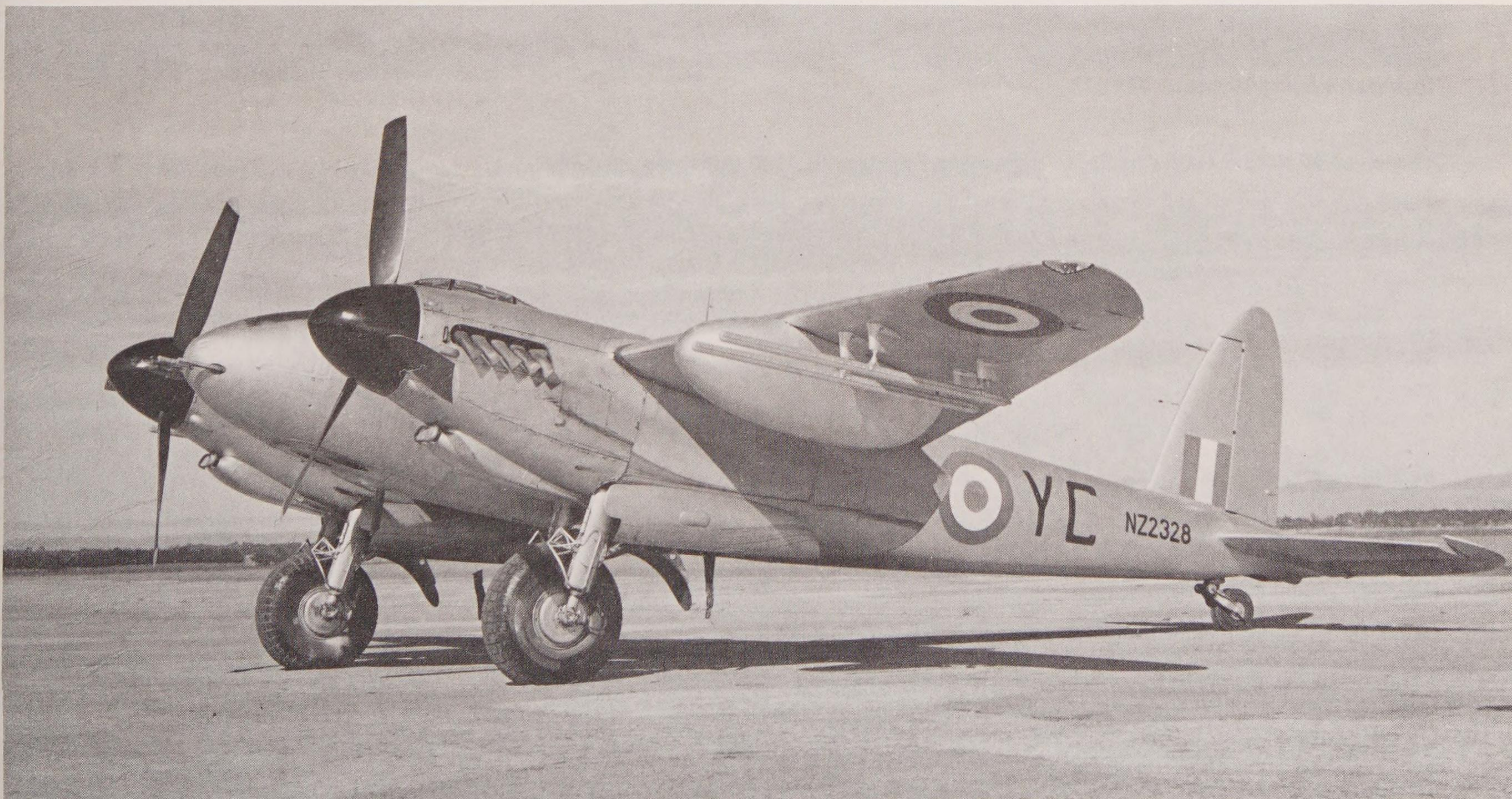
**B.IV DK296, one of a number allocated to Russia, at Errol, before acceptance on August 31, 1944.**

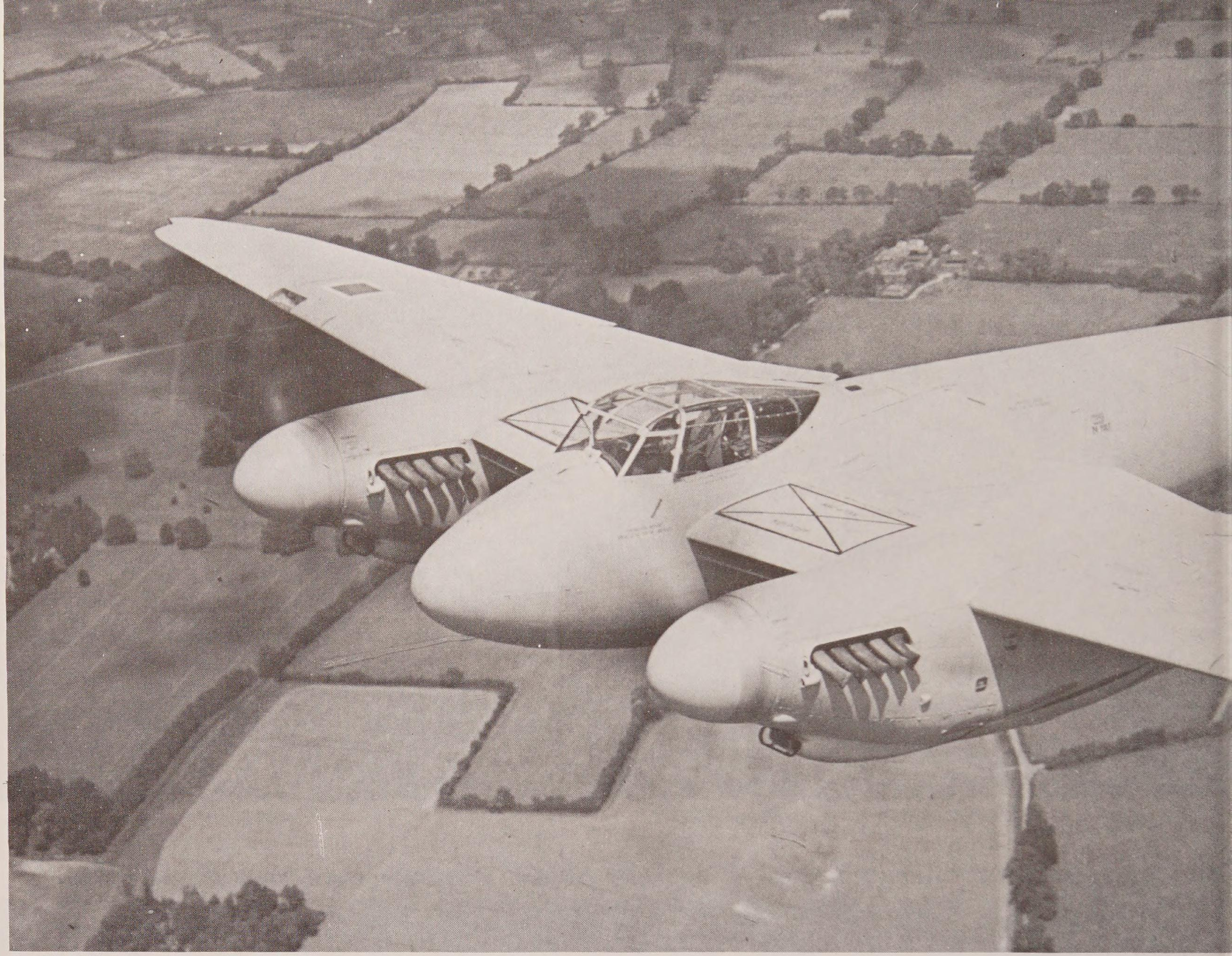



JONA
A52-525

British supplied FB.VI A52-525 J-NA of No. 1 Squadron RAAF.

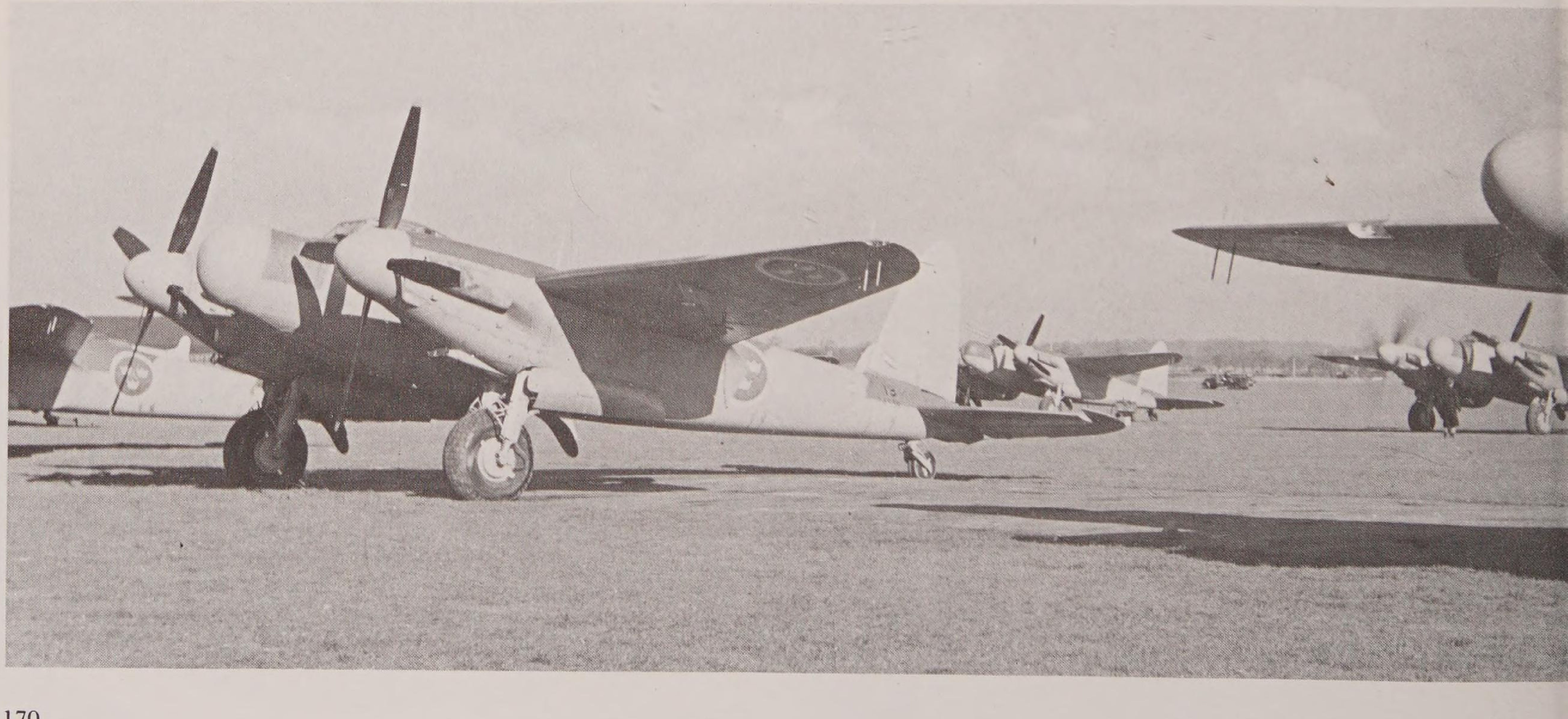
RNZAF Mosquito FB.VI NZ2328 of No. 75 Squadron, one of the ex RAF aircraft and now being restored at Christchurch, New Zealand.





Turkish Air Force Mosquito T.III 542.

A batch of NF.XIXs at Hatfield prior to delivery on February 26, 1949 to Sweden as J.30s.

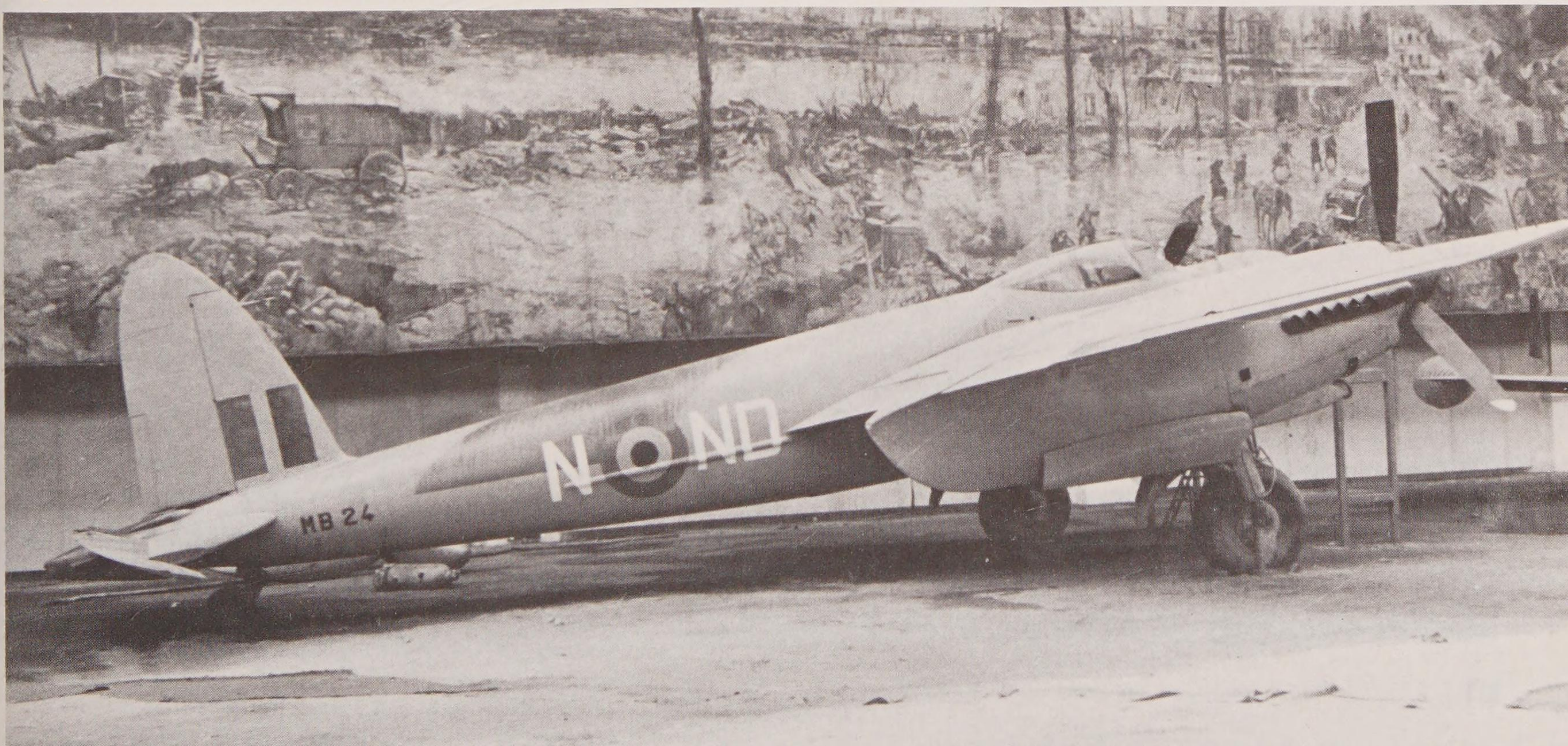


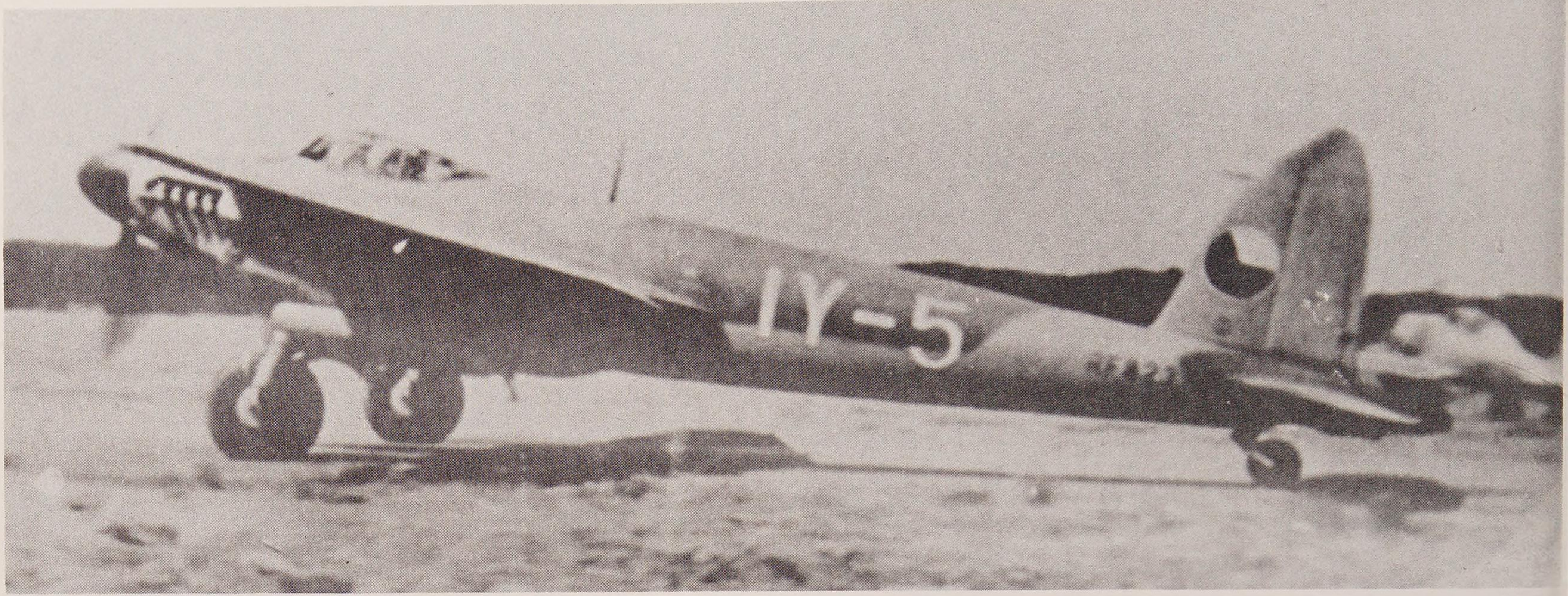
overhauled by Fairey Aviation. Fairey also supplied a batch of ex-RAF FB.VIs to the Dominican Military Aviation Corps in 1948. When the Belgian Air Force was reformed on October 1, 1946, a mixture of FB.VIs and NF.30s was supplied, the night fighters equipping No 1 Wing at Beauvechain. The French Air Force used a mixture of Mosquito FB.VIs and PR.XVIs with 50e Escadre at Dijon in 1946. In 1948, the newly-formed nation of Israel acquired about 300 Mosquitoes of various marks from France, Britain and other sources; many were in poor condition and were used for spares to keep the remainder flying. When 333 (Norwegian) Squadron returned home in 1945 they were renumbered 334 Squadron, and 18 MkVIs and five T.IIIs were purchased by Norway after the war. A number of surplus FB.VIs were purchased by Czechoslovakia after the war, and a flight of aircraft was supplied to the newly-established Burma Air Force in 1955.

In 1948 a batch of T.27s and FB.26s (possibly numbering as many as 205) was supplied to China from surplus Canadian stocks. The order for the Chinese Nationalist government, worth between $10 and $12 million, was announced in December 1947, but publicity was avoided as much as possible. The Mosquitoes were overhauled at the de Havilland factory at Downsview, test flown, dismantled and then transported by rail to a suitable East Coast Canadian port for shipment by sea to Shanghai, before being handed over to the Chinese Air Force. A small number of Chinese Air Force pilots were trained at Downsview early in 1948 to form the nucleus of the instructional staff of China.

The de Havilland technical team arrived in China in mid-December 1947, and the first shipment of four Mosquito MkXXVII trainers followed at the beginning of February 1948. The second batch, comprising 30 mixed trainers and fighter bombers arrived in March. However, owing to the exposure of the cargo on the ship's deck, some of the arrivals were only fit for cannibalisation as spares. The de Havilland team was assisted by plentiful Chinese labour and, surprisingly, there was little difficulty with languages, except in the case of very technical terms. Although problems caused delays with the first aircraft, ten months after their arrival more than three aircraft per week were being completed, and by August aircraft were being produced at the rate of one a day.

**Belgian NF.30 MB 24 which served with No. 1 Wing at Beauvechian and is now preserved in Brussels.** *Stuart Howe*





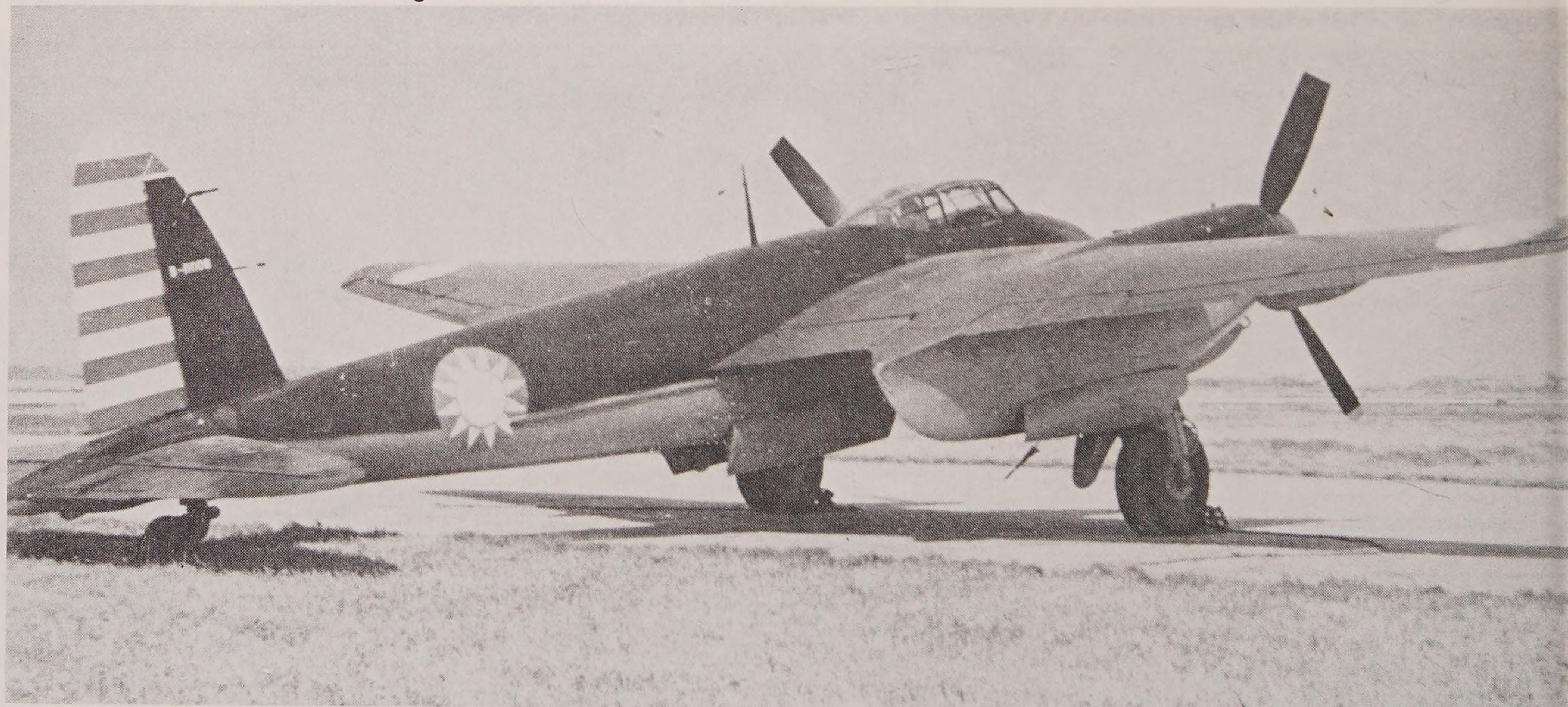
**Standard built FB.VI RF823 1Y-5 in service with the Czech Air Force.** *Phillip Jarrett*

One member of the de Havilland team was Jim Crowe, an ex-wartime RAF Squadron Leader who is now a Flight Engineer at Hatfield. He was the Merlin engine specialist, and on one occasion was in a Jeep when it was rammed by another vehicle and forced off the road. Jim was trapped inside and received cuts and a bruised back, but the driver was in hospital for eight weeks. There were times when the drive to the airfield was made between warring Nationalist soldiers and Communist guerrillas. Jim met his wife while he was in China and returned home with her on completion of the operation; in recent years they have revisited China on the delivery flights of Trident airliners.

The training of the instructors for the crews of the three planned Chinese Mosquito Squadrons commenced at Downsview in early 1948. However, after seven aircraft were wrecked owing to the swing on take off and landing on the icy snow-lined runways, the entire training operation was moved to China. The pilots who had wrecked the seven Mosquitoes in Canada later wrecked nine more in China, and were obviously unable to cope with the aircraft, largely through fear of it. The new training base was at Hankow, 644km (400 miles) inland from Shanghai on the Yangtse River. An additional training team flew out from Canada on March 22, 1948.

The training airfield had a single runway 1,646m (5,400ft) long with very rough ground on one side, a taxi strip on the other side usually lined with aircraft, and a 4.5-6m (15 to 20ft) high dyke wall, which surrounded the field at either end. Additionally, the runway was nearly 90° to the direction of the strong wind, so it was hardly the most suitable site for undershooting, overshooting or swinging off. The first of the three squadrons to commence conversion was No. 4, which had last flown tricycle-undercarriage Mitchells some nine months before, and the crews were somewhat unhappy about flying Mosquitoes. However, the younger and more current crews of

**Canadian built FB.26 B-M008 at Shanghai in March 1948.** *Jim Crowe*



1 and 3 Squadrons were able to adapt much more easily and had greater confidence. Most of the pilots went solo after 5-10hr dual, but some of the slow starters took 18hr and still became competent pilots. Others were completely hopeless and were taken off the course, but although there were about 50 crashes at Hankow most of the crews were able to step out of the wreckage. Maintenance was also a problem in the hot summers and cold winters, especially as the Chinese ground crew were not as experienced as they might have been and some spares were in short supply.

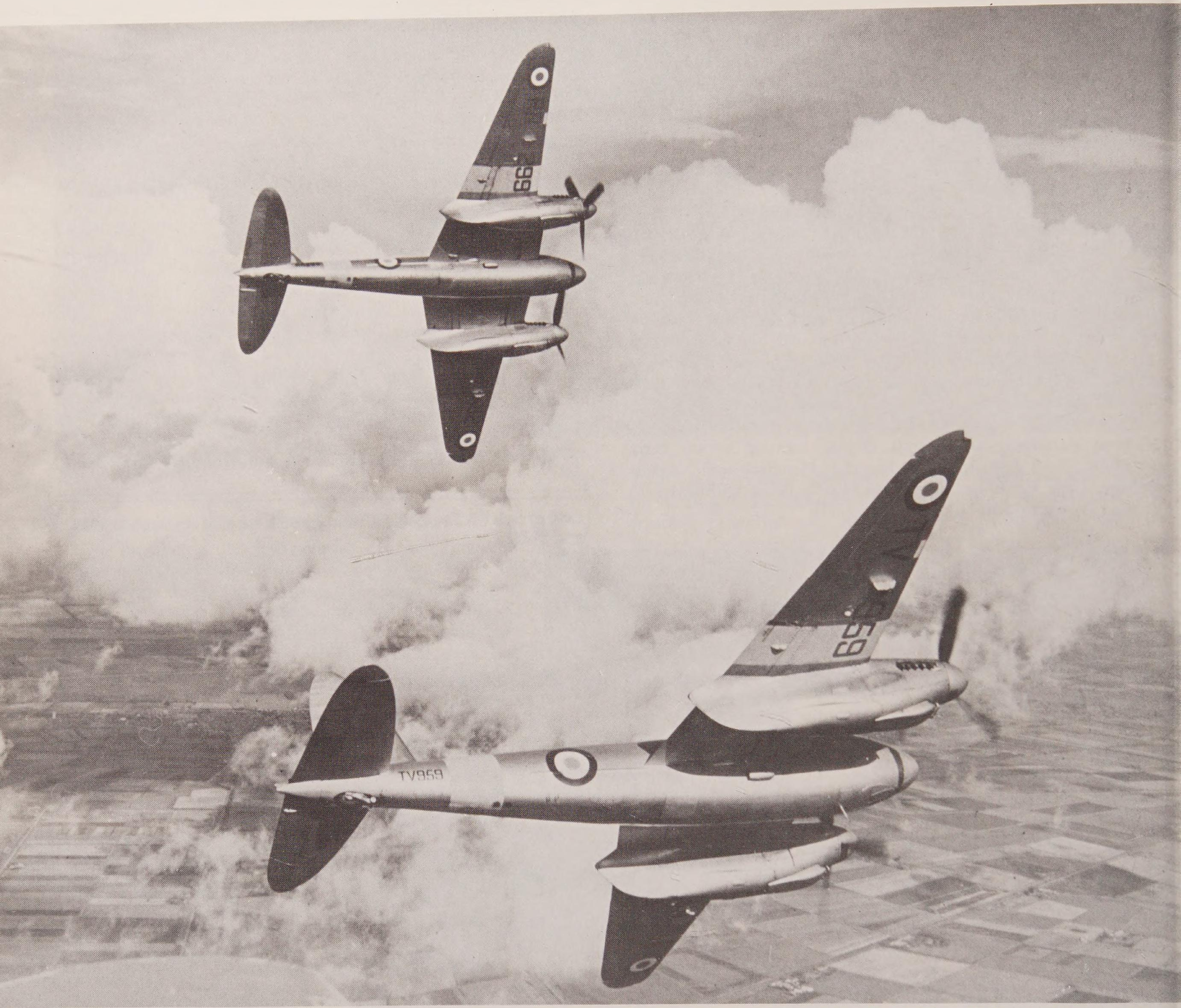
The Communist guerrillas were fighting their way down from the north, and it was decided that the training programme would end in December. However, their advance became so rapid that the Mosquito team pulled out in a hurry on December 17 to leave the Chinese crews to operate the aircraft on their own. It is unlikely that the surviving aircraft lasted very long. Although the contract was for 160 aircraft, it appears that 181 were assembled, of which 144 had been test flown by December 4. About 60 were crashed and 40 were grounded owing to maintenance problems. Despite the many difficulties the accident rate was no higher than on Canadian or British OTUs, and No 3 Squadron at Peiping had the excellent record of not even damaging an aircraft during training or on early operations. No 1 Squadron was based at Hsuchow and No 4 at Hankow, their surviving aircraft eventually being withdrawn to Formosa for use on anti-shipping operations.

## Civil Operations

After the war a number of surplus Mosquitoes were used on commercial operations. Two PR.34s were used by British European Airways (BEA) in 1948 and 1949 for gust research from their base at Northolt. Ten Mk35s, comprising nine B.35s and a PR.35, were bought by Spartan Air Services for air survey work in Canada. David Ogilvie was given the job of collecting these aircraft from storage at Silloth, and to refamiliarise himself he flew T.III RR299, now with British Aerospace, which was then on the charge of the Home Command Examining Unit at White Waltham. Each aircraft was air tested at Silloth and then ferried to the small grass airfield at Burnaston, near Derby, which has since closed. There was only room in the hangars for two aircraft to be converted at a time, the others being stored outside on the airfield.

Following conversion, each aircraft was air-tested by David Ogilvie, who ferried them up to Prestwick, where Scottish Aviation prepared them for their North Atlantic Ferry. David was not involved in these flights, and although all arrived safely two did suffer from engine trouble during the ferry. A further Mk.35 was collected from Shawbury and taken to Burnaston, where it was registered G-AOSS in readiness for a planned South Atlantic record

**One of two PR.34s G-AJZE used by BEA for gust research in 1948 and 1949.**



**Home Command Examining Unit T.IIIs TV959 and RR299 based at White Waltham.** *Flight*

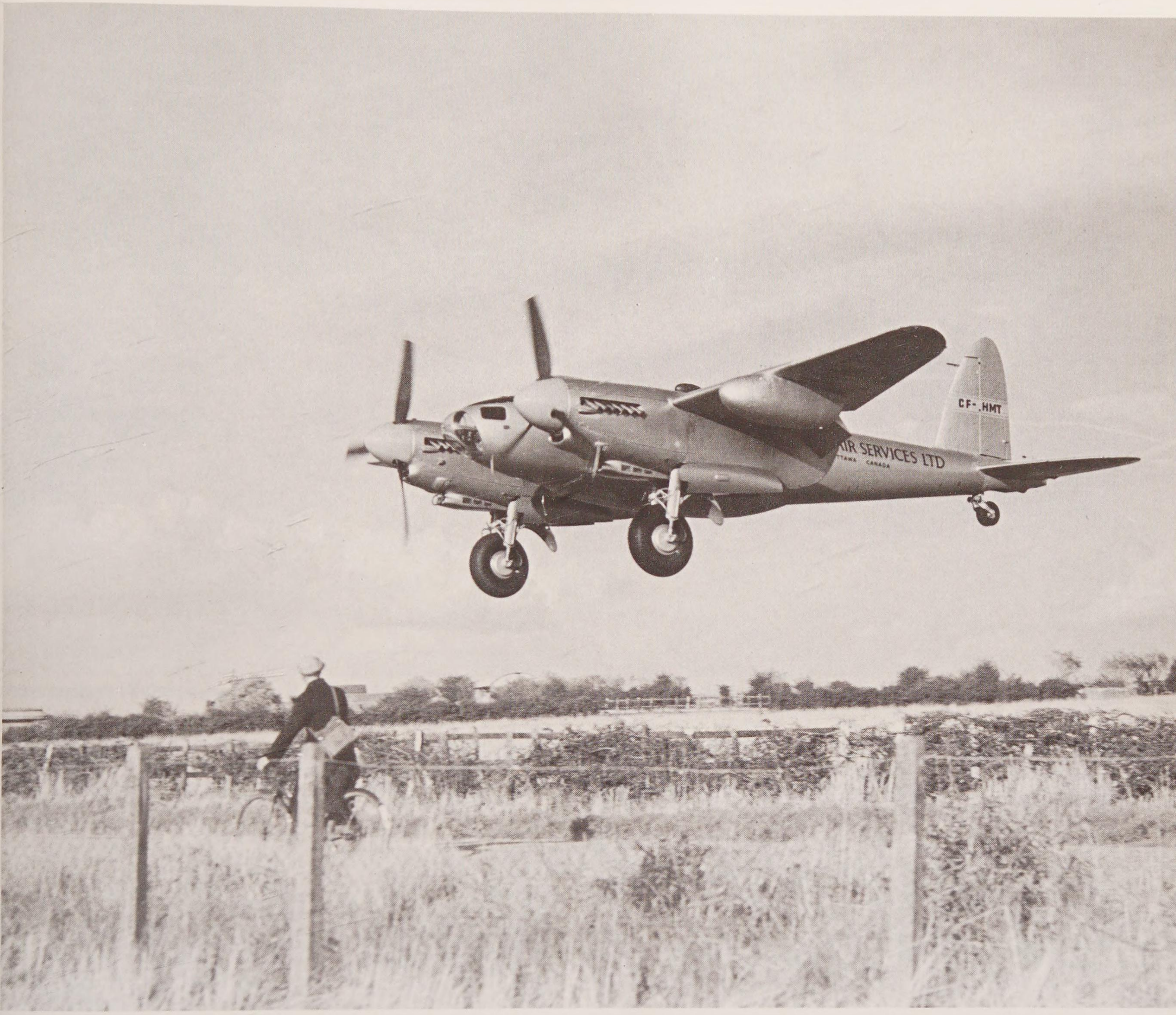
flight. The progress payments for the conversion were not forthcoming, the work was shelved, and the aircraft ended up as a November 5 bonfire centrepiece on the airfield.

A number of Australian and Canadian aircraft were modified for civil use, mainly for long endurance air racing, when their speed and range was a great advantage. Australian PR.41, VH-KLG was entered for the London to Christchurch air race in 1953, but it force-landed and was written off in Southern Burma on October 3 during its journey to the starting point. Another PR.41, VH-WAD, was entered in the same race but was subsequently withdrawn, and became a derelict at Perth, Western Australia.

Several Canadian, Australian and British-built Mosquitoes of various marks found their way on to the American civil register, and at least two were entered for the National Air Races. In 1951 Kenting Aviation used two Canadian aircraft on photographic survey work from their base at Toronto, prior to the operations by Spartan.

### Preserved Mosquitoes

Despite their wooden construction, a surprising number of Mosquitoes have survived to be preserved, mainly in static condition but occasionally in flying trim. Keeping a Mosquito flying is not only an expensive exercise, best offset by letting the aeroplane earn its keep in films and TV productions, but also very difficult technically. British Aerospace operate Mosquito T.III RR299, flying it more regularly than any other Mosquito. It has a restricted Certificate of Airworthiness and is maintained with loving care and enthusiasm by Harry Robins at Chester. Despite all his care, he cannot prevent deterioration, particularly in such things as hydraulic seals. Whilst flying the aircraft on one occasion Ron Clear selected undercarriage down but was unable to obtain a green light.



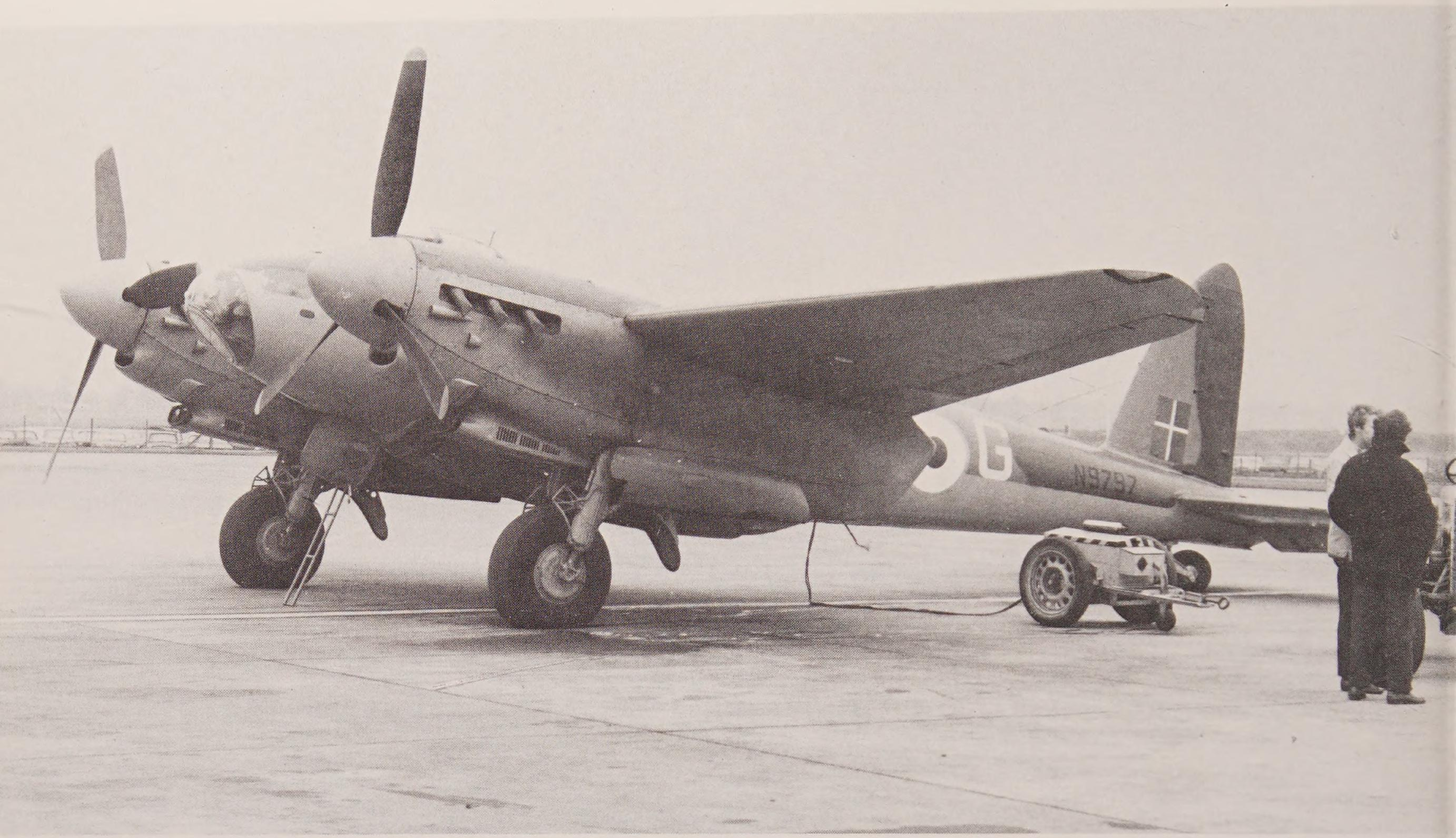
**Spartan Mk.35 CF-HMT (ex RS711) on a pre-delivery test flight from Burnaston, which left Prestwick for Canada on April 9, 1956.** *Flight*

He was eventually able to lock the mainwheels down by holding down the emergency selection lever and building up pressure on the hand pump, which released just enough surge to lock the units. It was found that the seals in the selector jack had perished and broken away, allowing the hydraulic fluid to by-pass the piston, and a replacement set of seals had to be specially made.

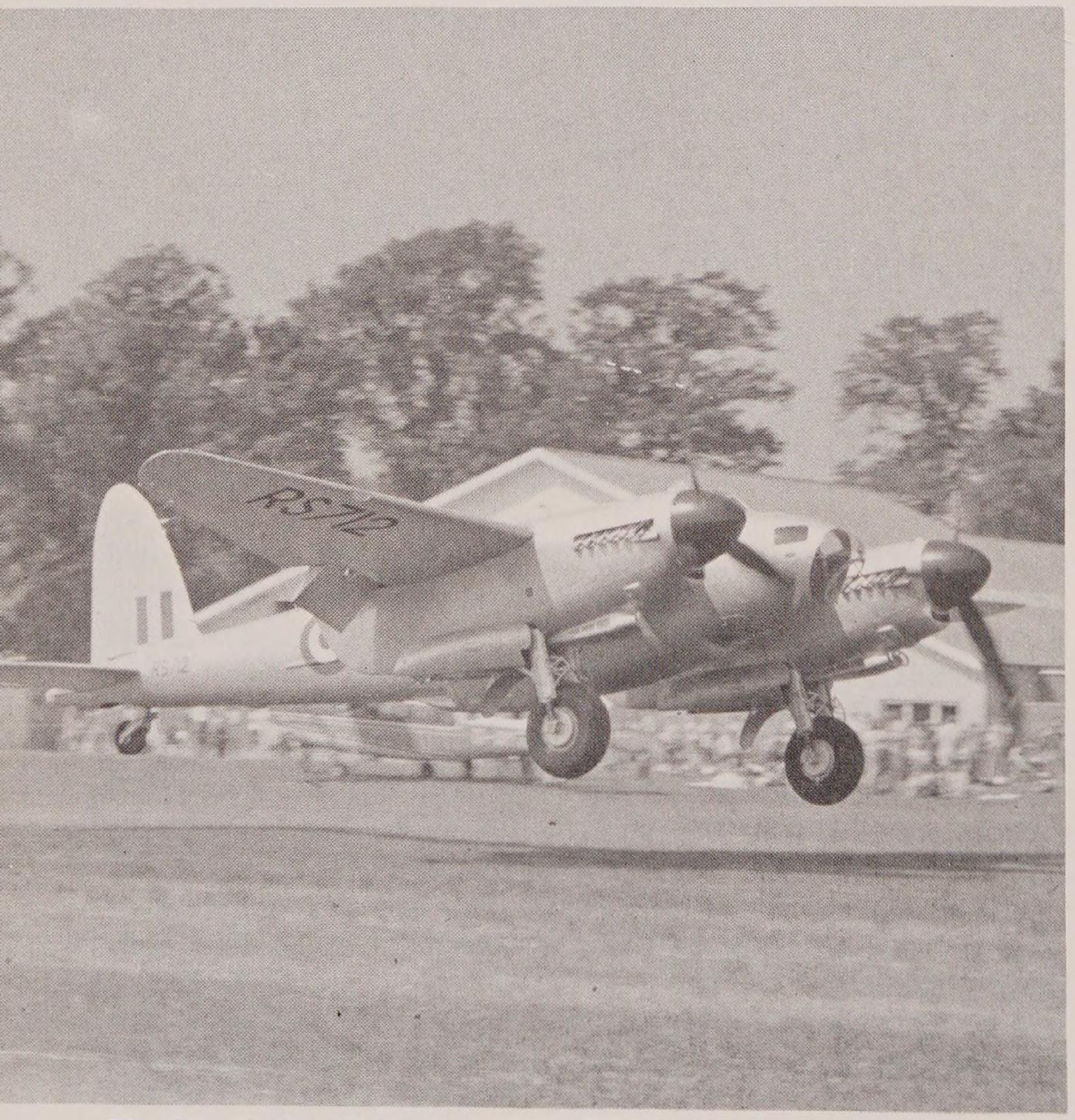
The exhaust stubs were often a problem, the tube itself breaking away from the flange, so replacements have been made. People always try to help wherever possible, and valuable spares are often located quite by chance. Ron Clear was telephoned one day by an electronics engineer from the Dynamic Group on the other side of Hatfield aerodrome. He had bought a cathode ray tube at a military surplus sale, and when he unpacked the box he also found a unit marked CSU – Merlin 25. It was still in its original wrapping and in perfect condition. Ron gratefully accepted the Constant Speed Unit for the propeller and it has been fitted to the aircraft, replacing one which was less than perfect. The total cost was £5.

Mosquito T.III RR299 was collected from 27 MU at Shawbury by Pat Fillingham in July 1963, and was allocated the civil registration G-ASKH, which it does not carry. It is normally kept at the Chester factory, and is painted in fighter bomber camouflage, carrying the fictitious unit code HT-E used during filming. John Cunningham has flown this aircraft and the current pilots, in addition to Ron Clear, are Chris Capper and George Aird, both based at Chester.

Two other potentially airworthy Mosquitoes are both B.35s, and both are in Britain, although some of the restorations in other parts of the world may result in further airworthy aircraft. RS709/G-ASKA, used in the films *633 Squadron* and *Mosquito Squadron,* was with the Skyfame Museum for a while, replacing an aircraft

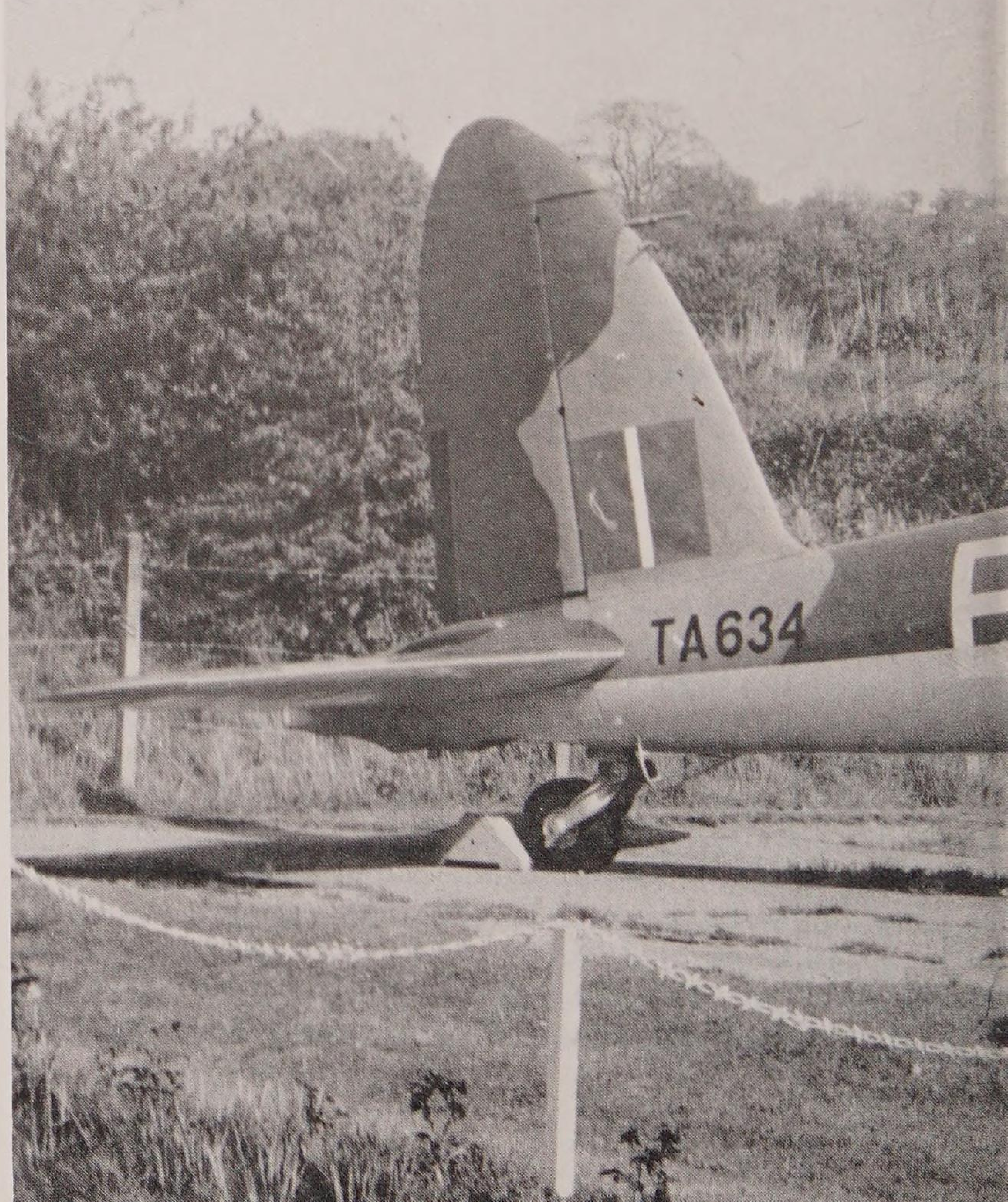


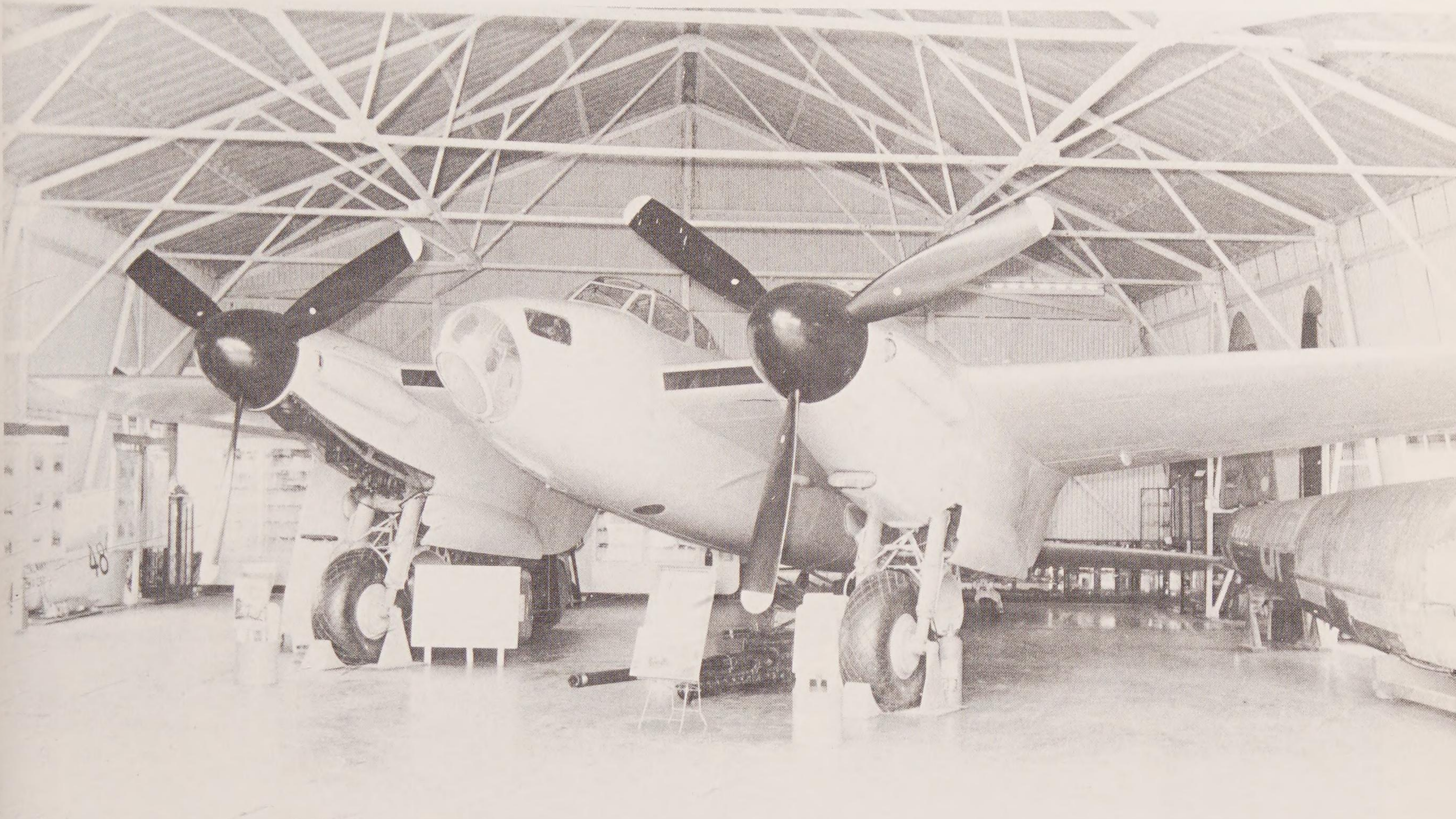
Mk35 RS709 re-registered N9797 at Luton ready for its flight to North America on December 10, 1971.



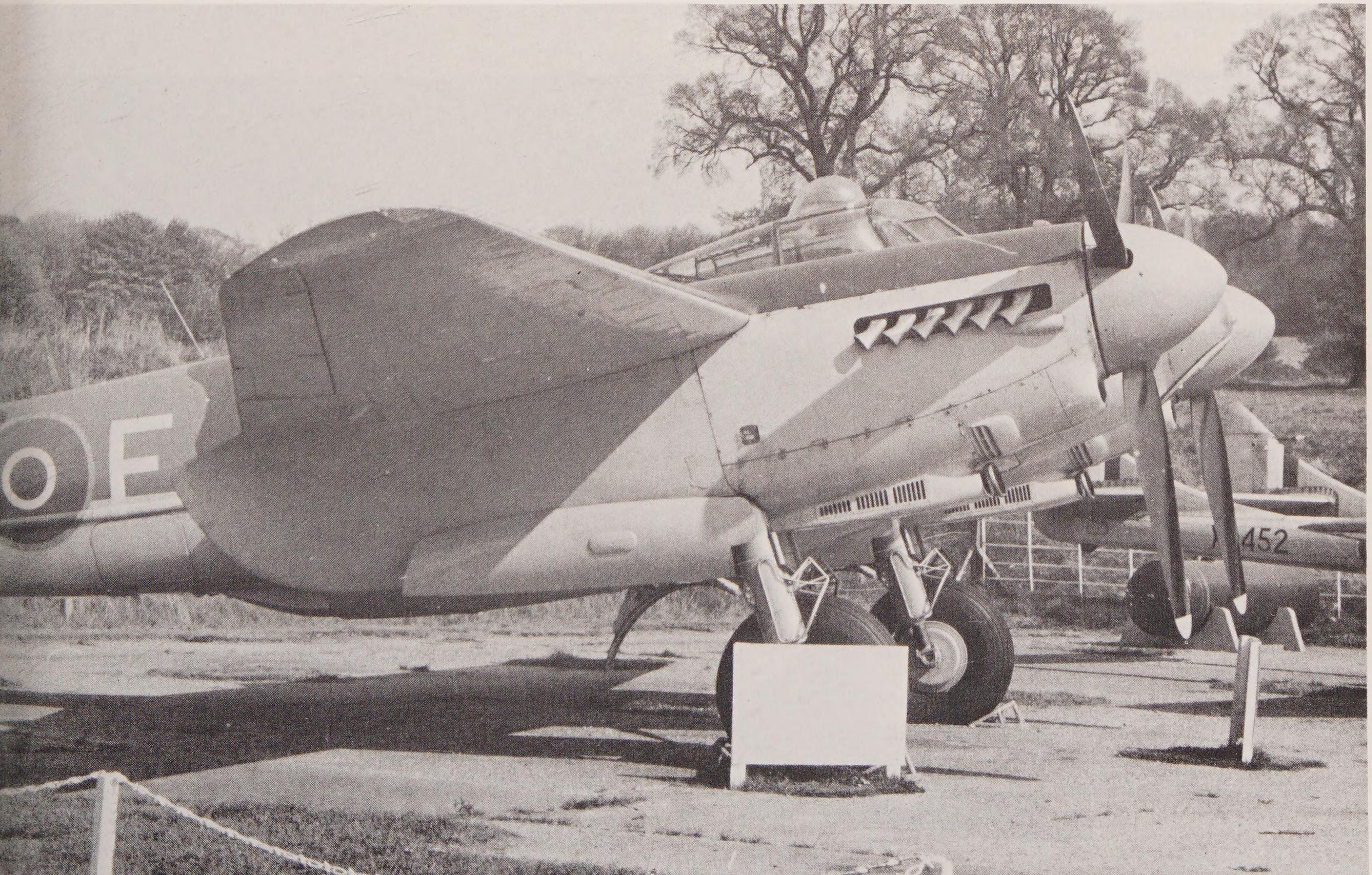
The Strathallan Collection Mk35 RS712 making one of its rare flights.

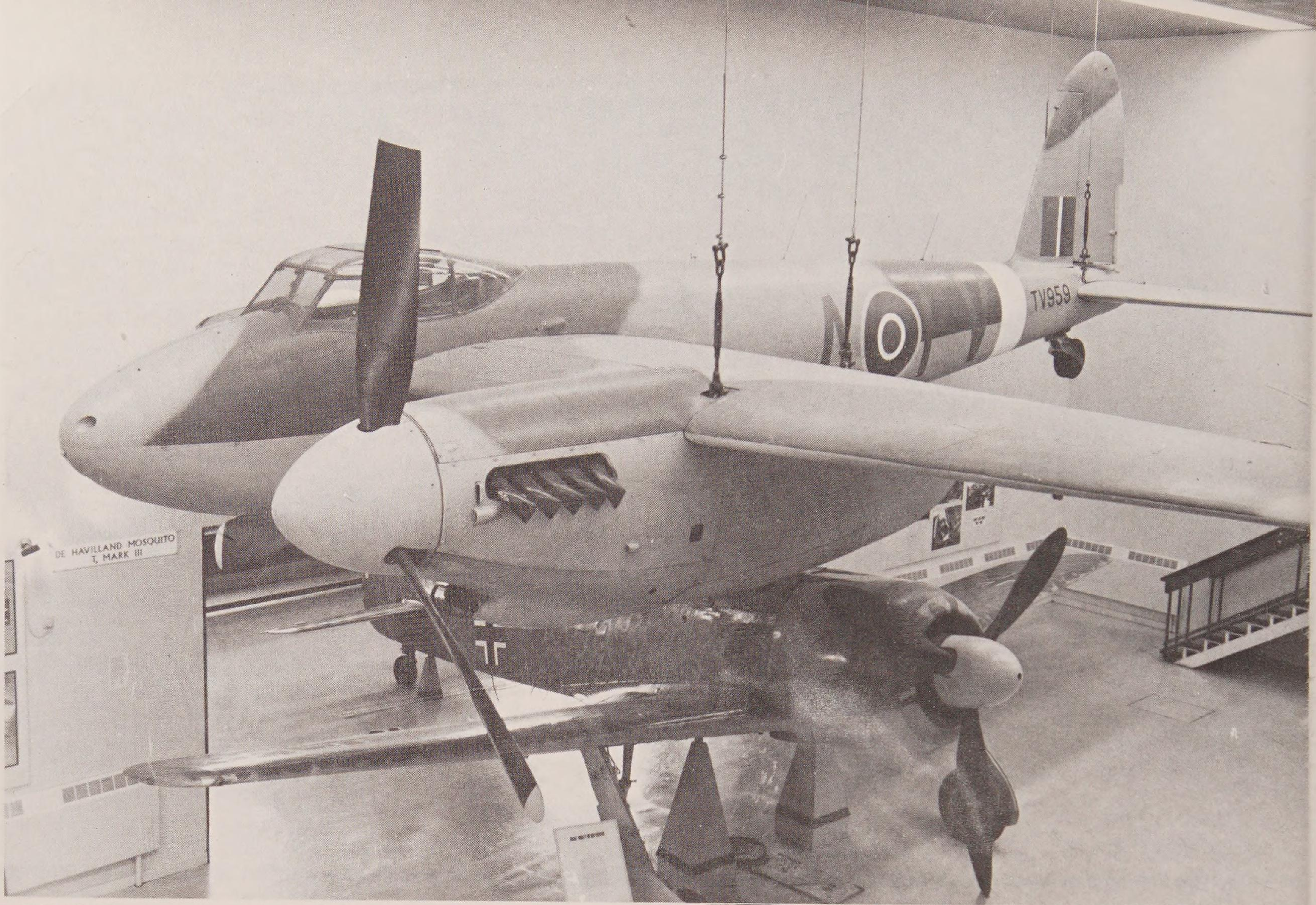
Mk35 TA634 presented to the Mosquito Aircraft Museum by the Liverpool Corporation, and painted to represent Group Captain Pickard's aircraft.



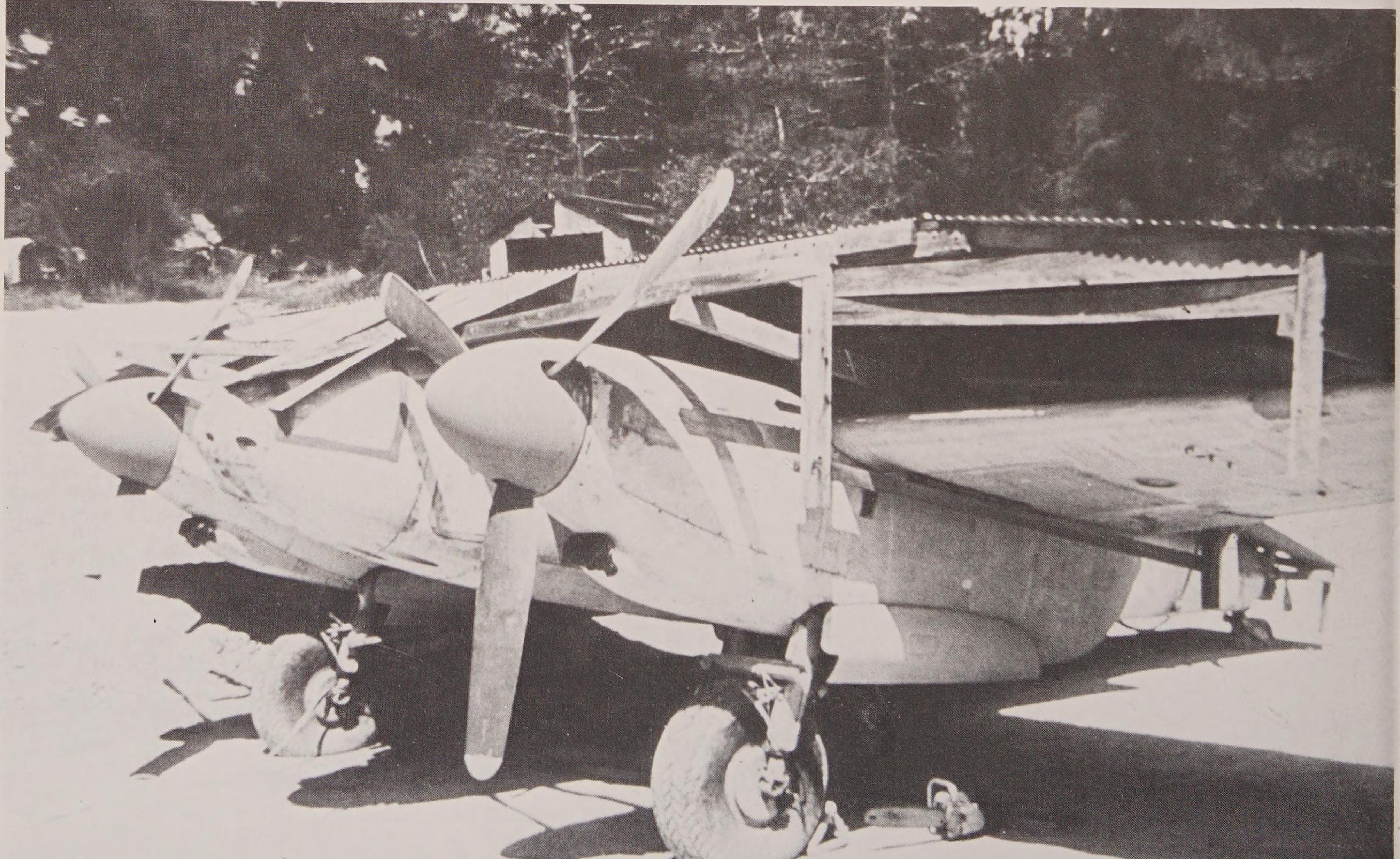


The prototype W4050 preserved at its birthplace at the Mosquito Aircraft Museum.




DE HAVILLAND MOSQUITO
T, MARK III
TV959

**T.III TV959 preserved in the Imperial War Museum at Lambeth, London. NZ2336 an FB.VI ex RAF TE910, protected by corrugated iron and timber frame at Nelson in New Zealand.** *Richard Cornwall via Stuart Howe*



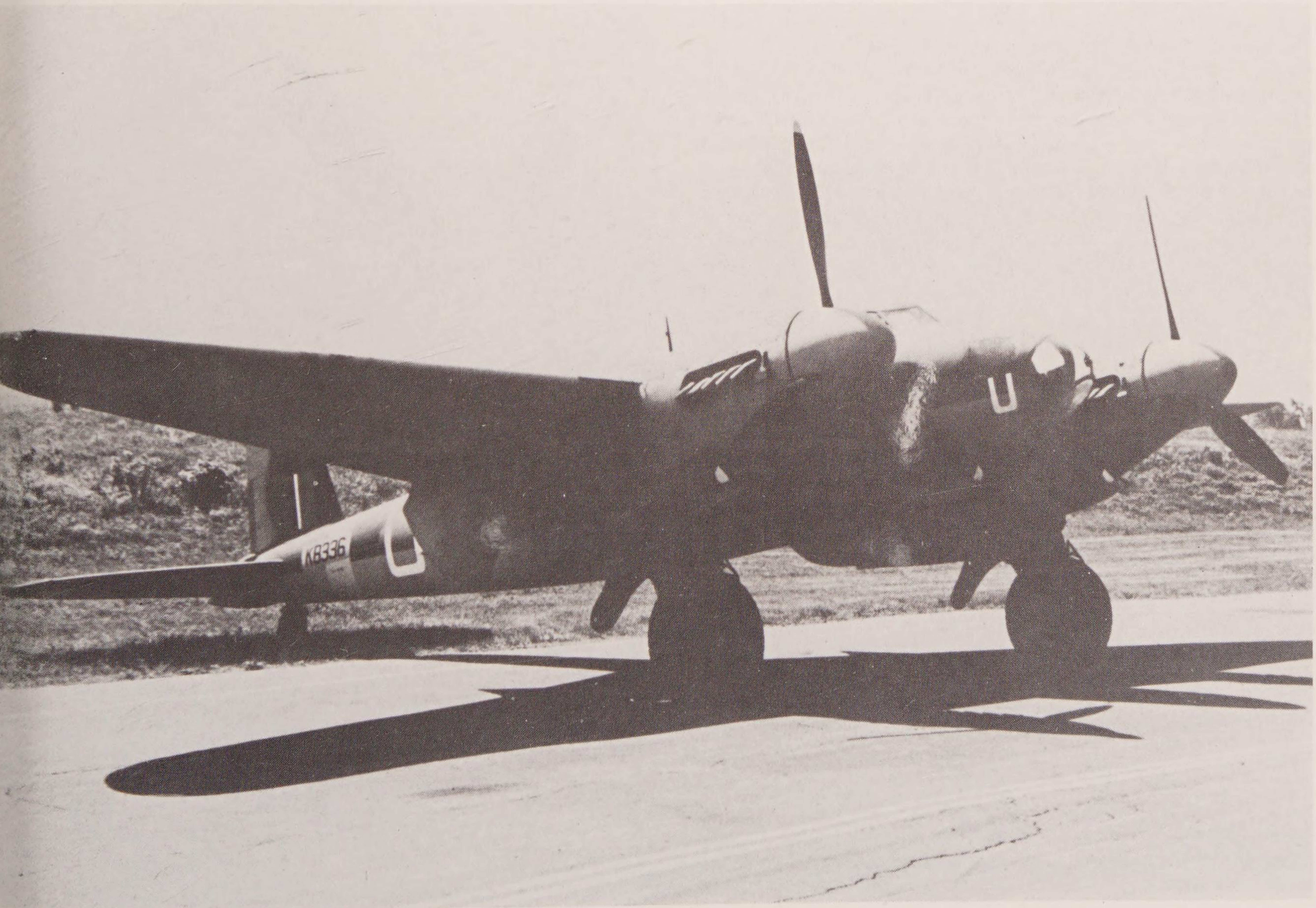
damaged in a landing accident. It was overhauled at Booker before departing Luton Airport on December 10, 1971, in readiness for its delivery flight across the North Atlantic, via the Azores, to its new home with the Confederate Air Force in Texas, where it was registered N9797. However, it had recently returned to Britain to become part of Douglas Arnold's collection of historic aircraft at Blackbushe. The Strathallan Collection in Scotland has RS712/G-ASKB, which was restored by Short Brothers at West Malling before flying north to its new base, but it has been seldom flown.

Statically preserved Mosquitoes are more common, the largest collection residing at the Mosquito Aircraft Museum at Salisbury Hall, near St Albans, Hertfordshire. The original prototype, W4050, is preserved there at its birthplace, where it has been on show since 1959, housed in a hangar donated by public subscription. In May 1971, it was joined by B.35 TA634, which flew in the films as G-AWJV and was generously donated by the Corporation of Liverpool. It is preserved in the markings of Grp Capt Percy Pickard's FB.VI, in which he and his navigator were killed on the Amiens prison raid. This aircraft has been displayed in the open since its arrival and needs constant attention to keep it in good order, the major task being the removal of all the old fabric covering and its replacement by new material, ready for repainting. The cockpit has also been restored and both engines changed, all by hitherto inexperienced but practical enthusiasts. This work had taken a number of years, due to the difficulties of doping in the British climate. Repairs have also been made to the woodwork, but in general it has stood up well to its time in the open. It is expected to be able to put this aircraft under cover for completion of the restoration when a new hangar is erected at the Museum, for which money is now being raised.

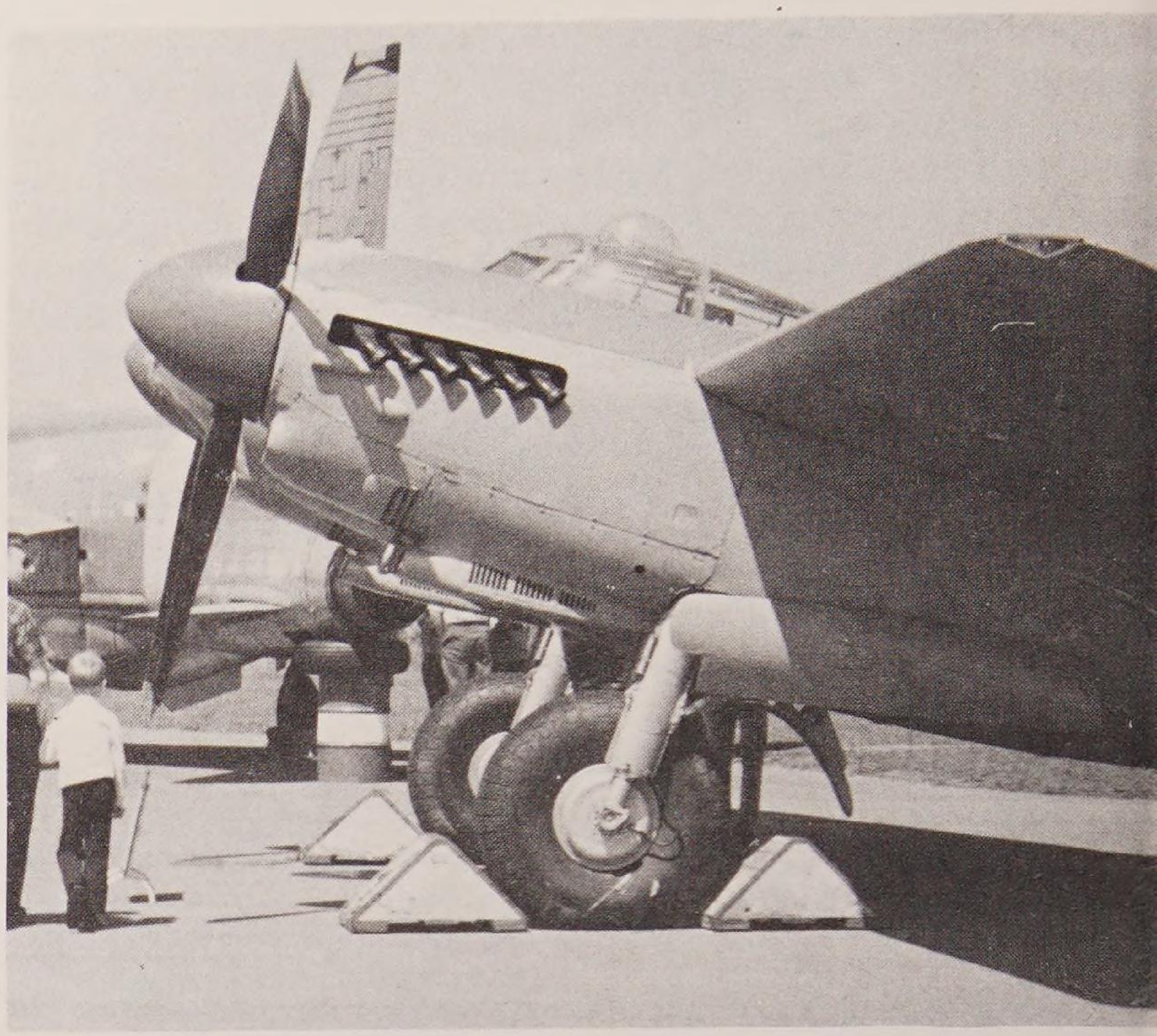
In February 1978 the fuselage of Mosquito FB.VI TA122 was donated to the Museum by the Royal Netherlands Air Force, having served with 605 and 4 Squadrons. This fuselage has been restored externally to its previous markings, and work is currently under way in the cockpit area, the canopy having been removed to gain better access.. It is also expected that a wing will become available for this fuselage, but it will require considerable rebuilding before it can be re-assembled. As mentioned earlier, the RAF Museum at Hendon houses the silver-painted T.III, TW117, which last flew with the CFS, and the Imperial War Museum in London has T.III TV959, displayed with the starboard wing sawn off outboard of the engine, owing to lack of space.

In addition to the FB.VI fuselage at the Mosquito Aircraft Museum, there are at least five more Mosquitoes of this mark surviving throughout the world. HR521 is at Camden in New South Wales, Australia, while two more are ex-RNZAF aircraft which served with 75 Squadron, NZ2328 under restoration at Christchurch and NZ2336 at Maheno. VA114 is recorded at Nannas, British Columbia in Canada, and PZ474 is being rebuilt at Placentia, California. Also in New Zealand is T.43 NZ2305, which came from an Australian production batch and served with 75 Squadron before being acquired by the Museum of Transport and Technology in Auckland.

**The sole surviving B.XX KB336 with the National Aeronautical Collection at Ottawa.**



**Mk35 TJ138 restored by RAF Colerne to the markings of No. 98 Squadron with whom it served.**



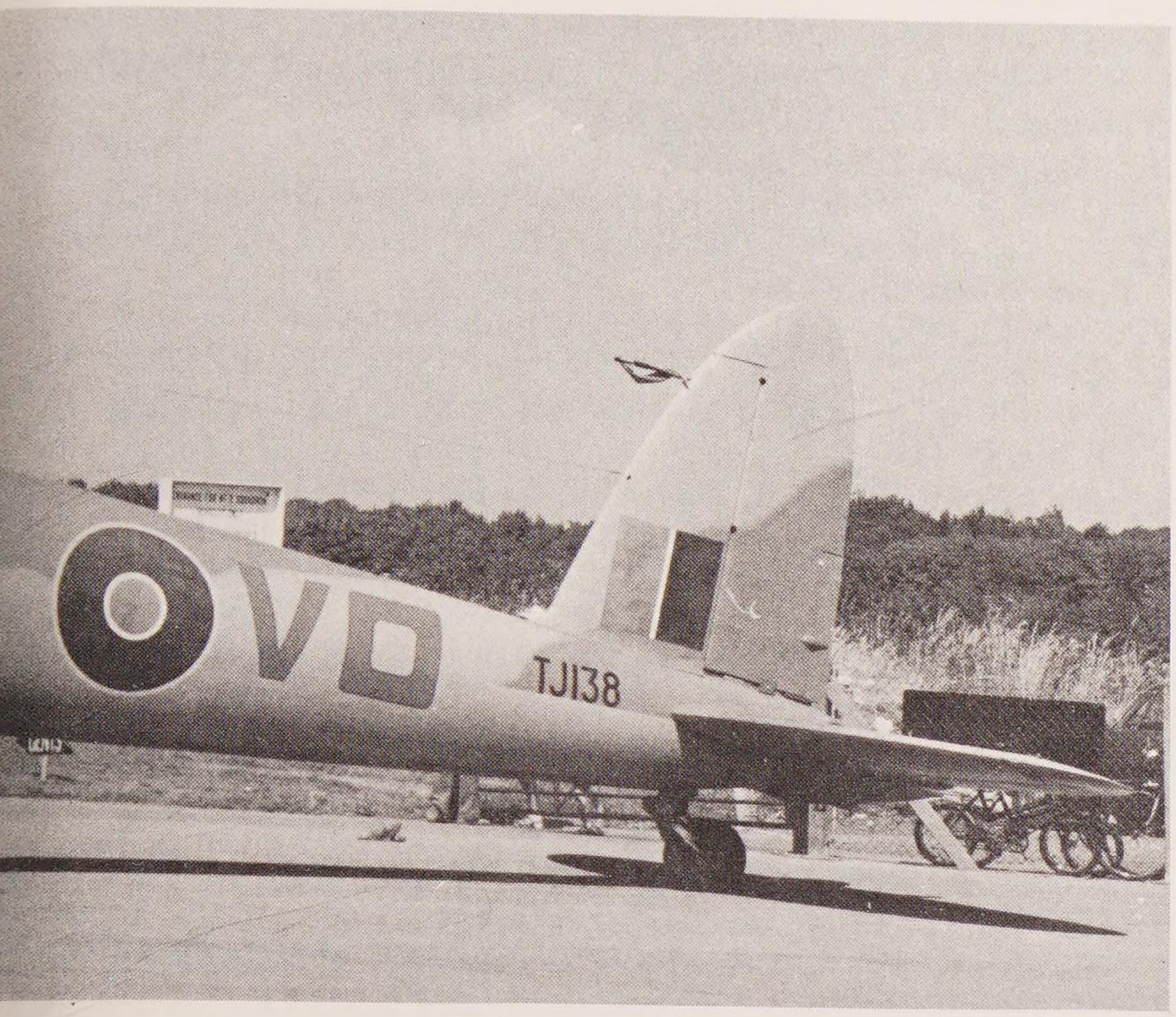
In Canada, the only recorded surviving B.XX, KB336, is part of the National Aeronautical Collection at Ottawa, having been allocated to 402 Squadron in Winnipeg in 1946 but not used. Two ex-Spartan Mk35s, CF-HML/VR796 and CF-HMS/RS700, the latter being the sole PR.35 in the batch, are preserved: 'HML, which last flew in 1963, is being restored at Kapuskasing, Ontario, and 'HMS is at Calgary. Another Mk35 was allocated the Argentine registration LV-HHN in December 1961, but is believed to be the aircraft which lay unattended at Mexico as XB-TOX for many years. It has since been rescued and moved to Canada for rebuilding. In the South African National War Museum in Johannesburg the blue-painted PR.IX LR480, which served with 60 Squadron SAAF, is suspended above the heads of the visitors, and PR.XVI A52-600 is in the Warbirds Aviation Museum at Mildura near Melbourne in Australia. On the European mainland the only recorded Mosquito preserved is the sole remaining night-fighter, NF.30 MB-24, which is in the Belgian Musée de l'Air in Brussels, having served with 11 Squadron, No 1 Wing.

Australian-built PR.41 VH-WAD, which was an aborted entry in the England to New Zealand Air Race in 1953, is reported at Tucson, Arizona, and B.35 TH998 was presented by the RAF to the Smithsonian Institution's National Air and Space Museum in Washington DC, where it has been put in store pending display space becoming available. The remains of another Mosquito are rumoured to be at Sun Valley, California.

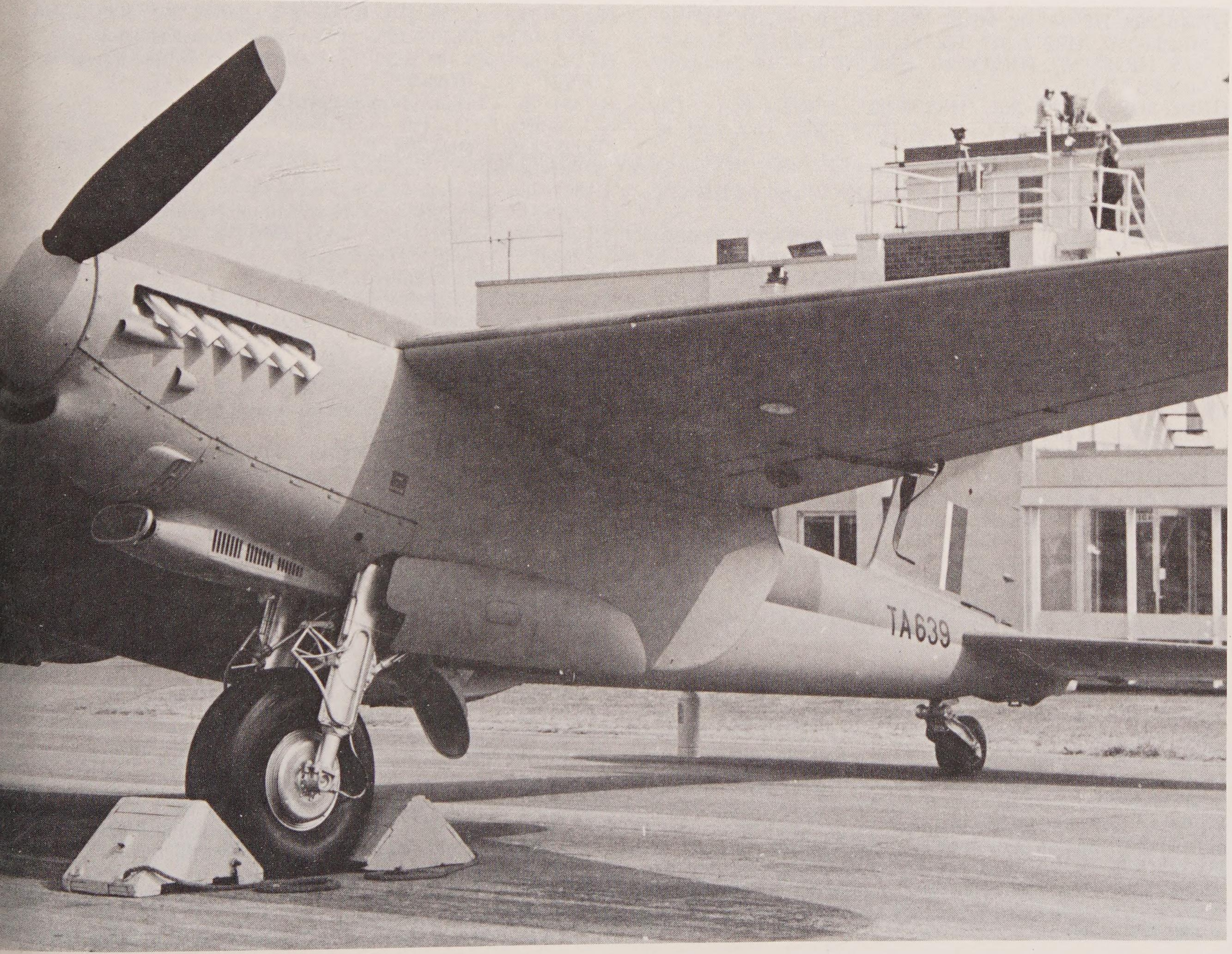
A number of Mk35s still exist in addition to those already mentioned, no doubt due to their late service use by 3 CAACU at Exeter. TJ138 served with 98 Squadron before going to 3 CAACU, and was restored to the former unit's markings at the RAF Colerne Museum before closure forced its move to Finningley and, more recently, Swinderby. TA719 was registered G-ASKC for the film *633 Squadron* and subsequently became part of the Skyfame Museum at Staverton, but was serously damaged on landing when both engines stopped on its approach to base. The aircraft lay out on the airfield for some time, but with the departure of RS709 it was taken in and partially repaired. When the Skyfame Museum closed down, the Mosquito and the majority of the other aircraft were moved to Duxford. Mk35 TA639 is preserved at the Aerospace Museum at Cosford, near Wolverhampton. Near York, Tony Agar is building up a NF.II HJ711 in the colours of 169 Squadron, using parts from at least three other aircraft.

Some 30 Mosquitoes in varying condition survive, though their locations may change from time to time. The British Aerospace Mosquito still attracts the attention of many people of all ages. Even if it is simply taxiing out and taking off for a display elsewhere, people stop and line the perimeter of the airfield, determined not to miss a moment. The type is remembered with as much affection as the Spitfire, and it certainly achieved far more than could ever have been expected from such modest beginnings. In its time it was a highly successful, cost-effective, multi-role combat aircraft, replaced only partly by the Canberra jet bomber, which was denied the chance of becoming a night fighter as well. The Mosquito is undoubtedly one of the classic aircraft of all time.

**Mk35 TA639 preserved at the Aerospace Museum at Cosford, near Wolverhampton.**



# APPENDICES



# APPENDIX 1

## PRODUCTION

W4050-’4099 50 initial batch, Hatfield-built PR.MkI, F.MkII, T.MkIII and B.MkIV
DD600-’644, DD659-’691, DD712-’759, DD777-’800, – 150 Hatfield-built F.MkII
DK284-’303 DK308-’333, DK336-’339 – 50 Hatfield-built B.MkIV
DZ228-’272, DZ286-’310 – 70 Hatfield-built F.MkII
DZ311-’320, DZ340-’388, DZ404-’442, DZ458-’497, DZ515-’559, DZ575-’618, DZ630-’652 – 250 Hatfield-built B.MkIV
DZ653-’661, DZ680-’727, DZ739-’761 – 80 Hatfield-built F.MkII
HJ108-’628 – 390 Canadian-built aircraft. Re-allocated
HJ642-’661, HJ699-’715 – 37 Hatfield-built NF.MkII
HJ662-’682, HJ716-’743, HJ755-’792, HJ808-’833 – 113 Hatfield-built FB.MkVI
HJ851-’899, HJ958-’999 – 91 Leavesden-built T.MkIII
HJ911-’944 – 34 Leavesden-built F.MkII
HJ945-’946, HK107-’141, HK159-’204, HK222-’235 – 97 Leavesden-built F.MkII converted to NF.MkXII by Marshalls at Cambridge.
HK363-’382, HK396-’437, HK453-’481, HK499-’536 (HK535-’536 renumbered SM700-’701) – 129 Leavesden-built NF.MkXIII
HP848-’888, HP904-’942, HP967-’989, HR113-’162, HR175-’220, HR236-’262, HR279-’312, HR331-’375, HR387-’415, HR432-’465, HR485-’527, HR539-’580, HR603-’649 – 500 Standard-built FB.MkVI
HX802-’835, HX849-’869, HX896-’922, HX937-’984 – 130 Hatfield-built FB.MkVI except HX902-’904, converted to MkXVIII
KA100-’102 – 3 Canadian-built FB.MkXXI
KA103-’450 – 348 Canadian-built FB.MkXXVI and T.MkXXIX (KA451-’773 cancelled)
KA873-’876 4 T.MkXXII, KA877-’895 19 T.MkXXVII, KA896-’897 2 T.MkXXII, KA898-’927 – 30 Canadian-built T.MkXXVII (KA928-’929, 2 cancelled)
KA930-’999 – 70 Canadian-built B.MkXXV
KB100-’299 – 200 Canadian-built B.MkXX (9 to USAAF)
KB300-’324 – 25 Canadian-built B.MkVII (6 to USAAF)
KB325-’369 – 45 Canadian-built B.MkXX
KB370-’699 – 330 Canadian-built B.MkXXV
LR248-’276, LR289-’313, LR327-’340, LR343-’389, LR402-’404 – 118 Hatfield-built FB.MkVI
LR405-’446, LR459-’474, LR478-’481 – 60 Hatfield-built PR.MkIX
LR475-’477, LR495-’513 – 22 Hatfield-built B.MkIX
LR516-’541, LR553-’585 – 59 Leavesden-built T.MkIII
ML896-’924 – 29 Hatfield-built B.MkIX
ML925-’942, ML956-’999, MM112-’156, MM169-’205, MM219-’226 – 152 Hatfield-built B.MkXVI
MM227-’257 – 31 Hatfield-built PR.MkIX/B.MkIX
MM258, MM271-’314, MM327-’371, MM384-’397 – 104 Hatfield-built PR.MkXVI
MM398-’423, MM426-’431 – 32 Hatfield-built FB.MkVI
MM424-’425 – 2 Hatfield-built FB.MkXVIII
MM436-’479, MM491-’534, MM547-’590, MM615-’623 – 141 Leavesden-built NF.MkXIII
MM624-’656, MM669-’685 – 50 Leavesden-built NF.MkXIX
MM686-’710, MM726-’769, MM783-’822 – 109 Leavesden-built NF.MkXXX
MP469 – 1 Hatfield-built MkXV
MT456-’500 – 45 Leavesden-built NF.MkXXX
MV521-’570 – 50 Leavesden-built NF.MkXXX
NS496-’538, NS551-’596, NS619-’660, NS673-’712, NS725-’758, NS772-’816 – 250 Hatfield-built PR.MkXVI, except for NS586-’589 – PR.Mk32
NS819-’859, NS873-’914, NS926-’965, NS977-’999, NT112-’156 NT169-’207, NT219-’238 – 250 Hatfield-built FB.MkVI including NT220, 224, 225/FB.MkXVIII
NT241-’283, NT295-’336, NT349-’393, NT415-’458, NT471-’513 NT526-’568, NT582-’621 – 300 Leavesden-built NF.MkXXX
PF379-’415, PF428-’469, PF481-’526, PF538-’579, PF592-’619 – 19 Percival-built B.MkXVI
PF620-’635, PF647-’680 – 50 Percival-built PR.Mk34
PZ161-’203, PZ217-’259, PZ273-’316, PZ330-’358, PZ371-’419 PZ435-’476 – 250 Hatfield-built FB.MkVI, including FB.MkXVIII
RF580-’625, RF639-’681, RF695-’736, RF749-’793, RF818-’859 RF873-’915, RF928-’966 – 300 Standard-built FB.MkVI
RF969-’999, RG113-’158, RG171-’175, – 82 Hatfield-buil PR.MkXVI
RG176-’215, RG228-’269, RG283-’318 – 118 Hatfield-buil PR.Mk34
RK929-’954 – 26 Leavesden-built NF.MkXXX
RK955-’960, RK972-’999, RL113-’158, RL173-’215, RL229-’268 – 163 Leavesden-built NF.Mk36
(RL269-’273, RL288-’329, RL345-’390 – 93 cancelled)
RR270-’319 – 50 Leavesden-built T.MkIIIs
RS501-’535, RS548-’580, RS593-’633 – 109 Hatfield-built FB.MkV
RS637-’680, RS693-’698 – 50 Airspeed-built FB.MkVI
RS699-’723 – 25 Airspeed-built B.Mk35
(RS724-’725, RS739-’779, RS795-’836, RS849-’893, RS913-’948 RS960-’999, RT105-’123 – 225 Airspeed, cancelled batch)
RV295-’326, RV340-’363 – 56 Hatfield-built B.MkXVI, excep RV348-’350 – B.Mk35
RV364-’367 – 4 Hatfield-built B.Mk35
SZ958-’999, TA113-’122 – 52 Hatfield-built FB.MkVI
TA123-’156, TA169-’198, TA215-’249, TA263-’308, TA323-’357 – Hatfield-built NF.MkXIX
TA369-’388 – 20 Hatfield-built FB.MkVI
TA389-’413, TA425-’449 – 50 Hatfield-built NF.MkXIX
TA469-’508, TA523-’560, TA575-’603 – 107 Hatfield-buil FB.MkVI (TA604-’613 cancelled)
TA614-’616 – 3 Hatfield-built PR.MkXVI
TA617-’618, TA633-’670, TA685-’724 – 80 Hatfield-built B.Mk35
TE587-’628, TE640-’669, TE683-’725, TE738-’780, TE793-’830 TE848-’889, TE905-’932 – 266 Standard-built FB.MkVI (TE933-’944, TE958-’999 – 54 cancelled)
TH976-’999, TJ113-’158 – 70 Hatfield-built B.Mk35
TK591-’635, TK648-’656, 54 Hatfield-built B.Mk35 (TK657-’679 TK691-’707, 41 cancelled)
(TN466-’497, TN510-’530, TN542-’590, TN608-’640, TN652-’674 TN690-’736, TN750-’789, TN802-’838, TN850-’864 – 297 cancelled Leavesden batch)
TS444, TS449 – 2 Leavesden-built TR.Mk33 prototypes.
TN954-’984, TW101-’119 – 50 Leavesden-built T.Mk3
TW227-’257, TW277-’295 – 50 Leavesden-built TR.Mk33 (TW24 TR.Mk37 prototype)
VA871-’894, VA923-’928 – 30 Leavesden-built T.Mk3 (VA929-’948 cancelled)
(VL557-’583, VL586-’599, VL602-’610 – 50 cancelled B.Mk35)
VL613-’625 – 13 Hatfield-built PR.Mk34
(VL678-’697, VL714-’723 – 30 cancelled PR.Mk34)
VL726-’732 – 7 Airspeed-built FB.MkVI
VP178-’202 – 25 Airspeed-built B.Mk35
VP342-’355, VR330-’349 – 34 Hatfield-built T.Mk3
VR792-’806 – 15 Airspeed-built B.Mk35
VT581-’596, VT604-’631 – 44 Hatfield-built T.Mk3
VT651-’683, VT691-’707 – 50 Hatfield-built/Chester-buil NF.Mk38 (VT670 1st from Chester, f/f 30.9.48)
VT724-’737 – 14 Chester-built TR.Mk37
VX860-’879, VX886-’916 – 51 Chester-built NF.Mk38 – complete November 1950
A52-1 – A52-212 – 212 Australian-built FB.Mk40 (6 as PR.Mk40

A52-300 – A52-327 – 28 Australian-converted PR.Mk41 (A52-300 converted to FB.42)
A52-1050 – A52-1071 – 22 Australian-converted T.Mk43

A total of 7,619 Mosquitoes built: Hatfield 3,326, Leavesden 1,476, Standard 1,066, Percival 245, Airspeed 122, Chester 96, Canada 1,076, Australia 212.

### Overseas Sales

Australia: 46 FB.VI and 29 PR.XVI
Belgium: 2 FB.VI and 18 NF.30
China: Mk.26 (approx 200)
Czechoslovakia: 19 FB.VI
Dominica: 6 FB.VI
France: 57 FB.VI, 29 PR.XVI, 23 NF.30
Israel: Approx 300 of various marks
Norway: 24 Mk.VI
RNZAF: 74 FB.VI
SAAF: 2 F.II and 14 PR.XVI
Sweden: 46 NF.XIX
Turkey: Mk.VI and T.III
Yugoslavia: 106 of various marks, including 60 NF.38

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# APPENDIX 2

## SPECIFICATION OF MOSQUITO VARIANTS: (Only Changes Are Noted After MkI)

**PR.MkI** Two x 1,460 h.p. Merlin 21 or 23 unarmed photo-reconnaissance aircraft, first flew June 10, 1941. Span 16.5m (54ft2in), length 12.35m (40ft6in), height 3.75m (12ft6in), wing area 42.1m² (454 sq ft), empty wt. 5,817kg (12,824lb), auw 8,922kg (19,670lb). Cruising speed 410km/hr (255mph), initial climb 14.5m/sec (2,850 ft/min), ceiling 10,668m (35,000ft), max range 3,508km (2,180 miles).

**F.MkII** Day and night long range fighter and intruder. First flew May 15, 1941. Length 12.54m (41ft2in), empty wt 6,092kg (13,431lb), auw 8,413kg (18,547lb). Max Speed 595km/hr (370mph), initial climb 15.2m/sec (3,000ft/min), ceiling 10,973m (36,000ft), max range 2,744km (1,705 miles). Four 20mm cannon and four .303 inch machine guns.

**T.MkIII** Dual control trainer, first flew January 1942. Unarmed. Empty wt. 5,944kg (13,104lb), auw 9,216kg (20,319lb). Max speed 618km/hr (384mph), cruising speed 418km/hr (260mph), initial climb 12.7m/sec (2,500ft/min), ceiling 11,430m (37,500ft), max range 2,510km (1,560 miles).

**B.MkIV** Day and night unarmed bomber, first flight March 1942. Length 12.41m (40ft9½in), empty wt. 6,531kg (13,400lb), auw 9,734kg (21,462lb). Max speed 611km/hr (380mph), cruising speed 426km/hr (265mph), ceiling 10,363m (34,000ft), max range 3,283m (2,040 miles).

**PR.MKIV** Day and night unarmed photo-reconnaissance aircraft, converted from B.IV, first flight April 1942, auw 8,165kg (18,000lb).

**B.MkV** Unbuilt projected bomber with empty wt. of 5,842.5kg (12,881lb) and auw of 8,616kg (18,994lb).

**FB.MkVI** Two x 1, 460 h.p. Merlin 21 or 23, or 2 x 1, 635 h.p. Merlin 25. Day and night fighter – bomber/intruder/long range fighter, first flight June 1, 1942. Four 20mm cannon plus four .303 machine guns, 2 x 113kg (250lb) bombs internally, plus 2 x 113kg (250lb) bombs under wings (2 x 227kg (500lb) on later aircraft) or 8 x 27kg (60lb) RP. Empty wt. 6,258kg (13,797lb), auw 9,436kg (20,804lb). Max speed 576km/hr (358mph), cruising speed 410km/hr (255mph), initial climb 14.5m/sec (2,850ft/min), ceiling 10,058m (33,000ft), max range 2,985km (1,855 miles).

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|---|---|
| **B.MkVII** | Two x 1, 460 h.p. Packard Merlin 31. Canadian bomber based on B.MkIV, first flight September 24, 1942. Used in North America only. |
| **PR.MkVIII** | Two x 1,565 h.p. Merlin 61. Photo-reconnaissance conversion of B.IV, but with two-stage Merlins. First flight October 20, 1942. Empty wt. 6,713kg (14,800lb), auw 9,704kg (21,395lb), max speed 702km/hr (436mph), cruising speed 459km/hr (258mph), initial climb 12.7m/sec (2,500ft/min) ceiling 11,582m (38,000ft), max range 4,104km (2,550 miles). |
| **PR and B.MkIX** | Unarmed photo-reconnaissance and bomber, 2 x 1, 680 h.p. Merlin 72, PR first flight April 1943, bomber first flight March 24, 1943. Length 13.5m (44ft6in), empty wt. 6,608kg (14,569lb), auw 11,278kg (24,865lb), max speed 656km/hr (408mph), cruising speed 402km/hr (250mph) initial climb 14.5m/sec (2,850ft/min), ceiling 11,582m (38,000ft), max range 3,943km (2,450 miles). |
| **NF.MkX** | Two 2-stage Merlin 61. Night fighter, not built. Length 12.54m (41ft2in). |
| **FB.MkXI** | Two 2-stage Merlin 61. Fighter bomber, similar to MkVI but not produced. |
| **NF.MkXII** | Two x 1,460 h.p. Merlin 21 or 23. Night fighter conversion of MkII with AI MkVIII under thimble radome. First flight August 1942. Four 20mm cannon. Length 12.3m (40ft5in), empty wt. 6,213kg (13,696lb), auw 9,206kg (20,297lb), max speed 595km/hr (370mph), cruising speed 410km/hr (255mph), initial climb 15.2m/sec (3,000ft/min), ceiling 10,973m (36,000ft), max range 2,743.5km (1,705 miles). |
| **NF.MkXIII** | Two x 1, 460 h.p. Merlin 21 or 23. Night fighter with universal wing and AI MkVIII under universal radome. First flight August 1943. Length 12.34m (40ft6in), empty wt. 6,327kg (13,948lb), auw 9,198kg (20,278lb), max speed 634km/hr (394mph), cruising speed 410km/hr (255mph), ceiling 10,516m (34,500ft), max range 2,993km (1,860 miles). |
| **N.F.MkXIV** | Two-stage Merlin Mosquito night fighter based on MkXIII. Not produced; superseded by NF.XIX and NF.30. |
| **NF.MkXV** | Two x 1,680 h.p. Merlin 72/73 or 1,710 h.p. Merlin 76/77. High altitude night fighter with four .303 machine guns in under-belly pack and fitted with AI MkVIII. First flight September 1942. Span 19m (62ft6in), Length 13.5m (44ft6in), wing area 44.4m² (479 sq ft), empty wt. 6,235kg (13,746lb), auw 7,983kg (17,600lb), max speed 663km/hr (412mph), cruising speed 370km/hr (230mph), initial climb 17.8m/sec (3,500ft/min), ceiling 13,106m (43,000ft), max range 1,657km (1,030 miles). |
| **PR and B.MkXVI** | Two x 1,680 h.p. Merlin 72/73 or 1,710 h.p. Merlin 76/77. Pressurised high altitude unarmed photo-reconnaissance or bomber. PR first flight July 1943, and bomber January 1, 1944. Span 16.5m (54ft2in), wing area 43m² (454sq ft), empty wt. 6,638kg (14,635lb), auw 11,756kg (25,917lb), max speed 656km/hr (408mph), cruising speed 394km/hr (245mph), initial climb 14.2m/sec (2,800ft/min), ceiling 11,277m (37,000ft), max range 2,390km (1,485 miles). |
| **NF.MkXVII** | Two x 1,460 h.p. Merlin 21 or 23. Night fighter fitted with SCR 720/729 or AI MkX radar. First flight March 1943. Length 12.3m (40ft6in), empty wt. 5,998kg (13,224lb), auw 9,250kg (20,393lb), max speed 595km/hr (370mph), cruising speed 410km/hr (255mph), initial climb 15.2m/sec (3,000ft/min), ceiling 10,972m (36,000ft), max range 2,744km (1,705 miles). |
| **FB.MkXVIII** | Two x 1,635 h.p. Merlin 25. Ground attack and anti-shipping fighter-bomber developed from MkVI. First flight June 8, 1943. Empty wt. 6,693kg (14,756lb), auw 10,557kg (23,274lb), two .303 machine guns plus one Molins 6-pounder 57mm cannon. |
| **NF.MkXIX** | Two 1,635 h.p. Merlin 25. Night fighter fitted with X/SCR 720/729 or AI VIII under universal nose. First flight April 1944. Length 12.3m (40ft6in), empty wt. 6,563.5kg (14,471lb), auw 9,865kg (21,750lb), max speed 608km/hr (378mph), cruising speed 410km/hr (255mph). |
| **B.MkXX** | Two 1,460 h.p. Packard Merlin 31 or 33. Canadian bomber version of B.IV to similar spec. |
| **FB.Mk21** | Two 1,460 h.p. Packard Merlin 31. Canadian version of FB.VI superseded by FB.26. |
| **T.Mk22** | Two 1,460 h.p. Packard Merlin 33. Canadian version of T.MkIII developed from FB.21. |

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| **B.Mk23** | Two 1,750 h.p. Packard Merlin 69. Projected Canadian version of B.IX. |
| **FB.Mk24** | Two 1,620 h.p. Packard Merlin 301. Projected Canadian high-altitude fighter bomber based on FB.21. |
| **B.Mk25** | Two 1,620 h.p. Packard Merlin 225. Improved single-stage Merlin-powered version of the Canadian B.XX with 907kg (2,000lb) bomb load. |
| **FB.Mk26** | Two 1,620 h.p. Packard Merlin 225. Canadian fighter-bomber version of FB.VI, improved from FB.21. Auw 9,739kg (21,473lb) and similar spec. to FB.VI. |
| **T.Mk27** | Two 1,620 h.p. Packard Merlin 225. Trainer developed from T.22, with more powerful engines. |
| **Mk28** | Not used. |
| **T.Mk29** | Two 1,620 h.p. Packard Merlin 225. Canadian trainer converted from FB.26. |
| **NF.Mk30** | Two 1,680 h.p. Merlin 72, 1,710 h.p. Merlin 76 or 1,690 h.p. Merlin 113. Night fighter development of NF.XIX with two-stage Merlins and AI MkX. First flight March 1944. Length 13.5m (44ft6in), empty wt. 6,078kg (13,400lb), auw 9,797kg (21,600lb), max speed 655km/hr (407mph), cruising speed 402km/hr (250mph), initial climb 14.5m/sec (2,850ft/min), ceiling 11,582m (38,000ft) max range 2,092km (1,300 miles). |
| **NF.Mk31** | Two 1,750 h.p. Packard Merlin 69, as fitted to NF.30, but version not built. |
| **PR.Mk32** | Two 1,690 h.p. Merlin 113/114, High altitude unarmed photo-reconnaissance aircraft based on PR.XVI, with two-stage Merlins and pressure cabin. First flight August 1944. Span 18m (59ft2in), length 12.35m (40ft6in), wing area 43.1m² (465 sq ft), empty wt. 6,477kg (14,281lb), auw 10,034kg (22,122lb), ceiling 13106m (43,000ft). |
| **TR.Mk33** | Two 1,635 h.p. Merlin 25. Torpedo-reconnaissance fighter/fighter-bomber for Royal Navy carrier operations developed from FB.VI to Spec.N.15/44. Fitted with upward-folding wings, arrester hook, four-bladed propellers, ASH radar and four 20mm cannon. Could carry 907kg (2,000lb) MkXV or XVII torpedo, or bomb or mine under belly. Other loads similar to MkVI. Span 16.5m (54ft2in), length 12.8m (42ft3in), empty wt. 6,735.5kg (14,850lb), auw 10,818.5kg (23,850lb), max speed 605km/hr (376mph), cruising speed 421km/hr (262mph), initial climb 9.2m/sec (1,820ft/min), ceiling 9,714m (30,100ft), max range 2,036km (1,265 miles). |
| **PR.Mk34** | Two 1,690 h.p. Merlin 114 and PR.Mk34A two 1,710 h.p. Merlin 114A. Very long range unarmed high altitude photo-reconnaissance aircraft. Fuel tanks in bulged bomb bay. Empty wt. 6,431kg (14,180lb), auw 11,567kg (25,500lb), max speed 684km/hr (425mph), cruising speed 483km/hr (300mph) initial climb 10.1m/sec (2,000ft/min), ceiling 13,106m (43,000ft), max range, 5,375km (3,340 miles). |
| **B.Mk35** | Two 1,710 h.p. Merlin 114A. Day and night bomber with enlarged bomb bay for 1,814kg (4,000lb) bomb. Some conversions to PR.Mk35 and many conversions to TT.Mk35. Empty wt. 6,638kg (14,635lb), auw 11,431kg (25,200lb), max speed 668km/hr (415mph), cruising speed 444km/hr (276mph), initial climb 13.7m/sec (2,700ft/min), ceiling 12,801m (42,000ft), max range 3,146km (1,955 miles). |
| **NF.Mk36** | Two 1,690 h.p. Merlin 113/114 or 1,710 h.p. Merlin 114A. Night fighter with improved radar and four 20mm cannon. Length 12.5m (41ft2in), wing area 42m² (454 sq ft), empty wt. 8,269kg (18,229lb), auw 9,706kg (21,400lb), max speed 650km/hr (404mph) ceiling 10,973m (36,000ft). |
| **TF.Mk37** | Two 1,635 h.p. Merlin 25. Torpedo fighter bomber with ASV MkXIII, developed from TR.33. First flight 1946. Data similar to TR.33. Max speed 616km/hr (383mph), range 1,770km (1,100 miles). |
| **NF.Mk38** | Two 1,710 h.p. Merlin 114A. Night fighter with more power and fitted with AI MkIX. Not used by RAF, and some sold to Yugoslavia. Length 12.6m (41ft5in), wing area 42m² (454 sq ft), empty wt. 8,269kg (18,229lb), auw 9,706kg (21,400lb), max speed 650km/hr (404mph), ceiling 10,973m (36,000ft). |
| **TT.Mk39** | Two 1,680 h.p. Merlin 72/73. Target tug conversion of MkXVI to RN Spec. Q.19/45, carrying three crew. Length 13.1m (43ft4in), wing area 42m² (454 sq ft), empty wt. 7,248.5kg (15,980lb), auw 10,433kg (23,000lb), max speed 481km/hr (299mph). Conversions by General Aircraft. |

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| **F.Mk40** | Two 1,460 h.p. Packard Merlin. Australian-built version of the FB.VI with conversions to PR.40. Empty wt. 6,506kg (14,344lb), auw 10,096kg (22,258lb), max speed 608km/hr (378mph), cruising speed 410km/hr (255mph), initial climb 12.1m/sec (2,400ft/min), ceiling 10,058m (33,000ft), max range 2,985km (1,855 miles). |
| **PR.Mk41** | Two 1,750 h.p. Packard Merlin 69. Australian two-stage Merlin photo-reconnaissance aircraft similar to MkIX. |
| **FB.Mk42** | Two 1,750 h.p. Packard Merlin 69. Australian fighter bomber; prototype only. |
| **T.Mk43** | Two 1,460 h.p. Packard Merlin 33. Australian trainer similar to T.III |

# APPENDIX 3

## MOSQUITO—EQUIPPED RAF AND RN UNITS

| Squadron | Code | Role | Period of Use | | |
|---|---|---|---|---|---|
| 4 | UP | fighter bomber | 1.44 | to | 7.50 |
| 8 | | bomber | 1.9.46 | to | 5.47 |
| 11 | OM | fighter bomber | 4.10.48 | to | 9.50 |
| 13 | | photo-recon. | 1.9.46 | to | 1952 |
| 14 | CX | bomber | 1.6.45 | to | 2.51 |
| 16 | EG | fighter | 20.9.45 | to | 31.3.46 |
| 21 | YH | fighter bomber | 10.43 | to | 7.11.47 |
| 22 | | fighter | 1.5.46 | to | 15.8.46 |
| 23 | YP | intruder and NF | 7.42 | to | 4.7.52 |
| 25 | ZK | night fighter | 17.5.42 | to | 9.51 |
| 29 | RO | night fighter | 10.42 | to | 1.51 |
| 39 | | night fighter | 9.49 | to | 3.53 |
| 45 | OB | fighter bomber | 12.2.44 | to | 5.46 |
| 47 | KU | fighter bomber | 18.2.45 | to | 21.3.46 |
| 55 | | fighter bomber | 7.46 | to | 1.11.46 |
| 58 | OT | photo-recon. | 8.47 | to | 1954 |
| 68 | WM | night fighter | 7.44 | to | 20.4.45 |
| 69 | WI | fighter bomber | 8.8.45 | to | 6.11.47 |
| 81 | | photo-recon. | 1.9.46 | to | 12.55 |
| 82 | UX | bomber and PR | 4.7.44 | to | 15.3.46 |
| 84 | PY | fighter bomber | 2.45 | to | 12.46 |
| 85 | VY | night fighter | 8.42 | to | 10.50 |
| 89 | | FB and NF | 21.5.45 | to | 30.4.46 |
| 96 | ZJ | night fighter | 11.43 | to | 12.12.44 |
| 98 | VO | bomber | 18.9.45 | to | 2.50 |
| 105 | GB | bomber | 11.41 | to | 1.2.46 |
| 107 | OM | fighter bomber | 2.44 | to | 4.10.48 |
| 108 | | night fighter | 2.44 | to | 24.7.44 |
| 109 | HS | bomber | 8.42 | to | 7.52 |
| 110 | | fighter bomber | 11.44 | to | 15.4.46 |
| 114 | RT | fighter bomber | 1.11.45 | to | 1.9.46 |
| 125 | VA | night fighter | 1.44 | to | 11.45 |
| 128 | M5 | pathfinder | 15.9.44 | to | 1.4.46 |
| 139 | XD | bomber | 6.42 | to | 6.53 |
| 140 | | photo-recon. | 11.43 | to | 10.11.45 |
| 141 | TW | night fighter | 10.43 | to | 3.52 |
| 142 | 4H | bomber | 25.10.44 | to | 28.9.45 |
| 143 | NE | ship strike | 11.44 | to | 1.6.45 |
| 151 | DZ | night fighter | 4.42 | to | 10.10.46 |
| 157 | RS | night fighter | 13.12.41 | to | 6.45 |
| 162 | CR | bomber | 1.44 | to | 14.7.46 |
| 163 | | bomber | 25.1.45 | to | 10.8.45 |
| 169 | VI | night fighter | 2.10.43 | to | 10.8.45 |
| 176 | | night fighter | 7.45 | to | 31.5.46 |
| 180 | EV | bomber | 9.45 | to | 1.4.46 |
| 192 | DT | bomber | 11.42 | to | 22.8.45 |
| 199 | | | 1.52 | to | 3.53 |

| Squadron | Code | Role | Period of Use | | |
|---|---|---|---|---|---|
| 211 | | fighter bomber | 6.45 | to | 22.2.46 |
| 219 | FK | night fighter | 27.2.44 | to | 3.53 |
| 235 | LA | ship strike | 6.44 | to | 10.7.45 |
| 239 | HB | intruder | 12.43 | to | 10.4.45 |
| 248 | QM | ship strike | 10.43 | to | 30.9.46 |
| 249 | GN | bomber | 2.46 | to | 12.46 |
| 254 | QM | ship strike | 3.45 | to | 5.45 |
| 255 | YD | night fighter | 9.2.45 | to | 31.3.46 |
| 256 | JT | night fighter | 4.43 | to | 12.9.46 |
| 264 | PS | night fighter | 5.42 | to | 2.52 |
| 305 | SM | fighter bomber | 12.43 | to | 10.46 |
| 307 | EW | night fighter | 12.42 | to | 2.1.47 |
| 333 | KK | photo-recon. | 10.5.43 | to | 21.11.45 |
| 404 | EO | ship strike | 4.4.45 | to | 25.5.45 |
| 406 | HU | night fighter | 4.44 | to | 31.8.45 |
| 409 | KP | night fighter | 3.44 | to | 1.7.45 |
| 410 | RA | night fighter | 12.42 | to | 9.45 |
| 418 | TH | intruder | 2.43 | to | 7.9.45 |
| 456 | RX | night fighter | 12.42 | to | 31.5.45 |
| 464 | SB | fighter bomber | 9.43 | to | 9.45 |
| 487 | EG | fighter bomber | 10.43 | to | 20.9.45 |
| 488 | ME | night fighter | 8.43 | to | 26.4.45 |
| 489 | P6 | | 5.45 | to | 1.8.45 |
| 500 | RAA | night fighter | 2.47 | to | 10.48 |
| 502 | RAC | bomber | 8.47 | to | 6.49 |
| 504 | RAD | night fighter | 3.48 | to | 7.48 |
| 515 | 3P | fighter bomber | 3.44 | to | 10.6.45 |
| 521 | | photo-recon. | 8.49 | to | 31.3.43 |
| 540 | DH | photo-recon. | 19.10.42 | to | 7.53 |
| 544 | | photo-recon. | 3.43 | to | 13.10.45 |
| 571 | 8K | bomber | 7.4.44 | to | 28.9.45 |
| 578 | | | 4.45 | to | 4.45 |
| 600 | BQ | night fighter | 1.45 | to | 21.8.45 |
| 604 | NG | night fighter | 4.44 | to | 18.4.45 |
| 605 | UP | intruder | 2.43 | to | 1.49 |
| 608 | 6T | bomber | 1.8.44 | to | 10.48 |
| 609 | RAP | night fighter | 4.47 | to | 3.49 |
| 613 | SY | fighter bomber | 12.43 | to | 8.8.45 |
| 616 | RAW | night fighter | 9.47 | to | 5.49 |
| 617 | | bomber | 4.44 | to | 3.45 |
| 618 | | fighter bomber | 1.4.43 | to | 25.6.45 |
| 627 | AZ | bomber | 12.11.43 | to | 30.9.45 |
| 680 | | photo-recon. | 2.44 | to | 1.9.46 |
| 681 | | photo-recon. | 8.43 | to | 12.43 |
| 684 | | photo-recon. | 10.43 | to | 1.9.46 |
| 692 | P3 | bomber | 1.1.44 | to | 20.9.45 |
| No 1 PRU | | photo-recon. | 13.7.41 | to | 19.10.42 |

## RAF Mosquito Training Units

204 AFS at Cottesmore, Driffield, Brize Norton, Swinderby and Bassingbourn until 1953
228 OCU, Leeming, 1.5.47 to 1954
229 OCU Chivenor
231 OCU Bassingbourn 1953
237 OCU Leuchars and Benson
8 OTU Fraserburgh 11.42, Dyce, Haverfordwest, Benson. Became 237 OCU, 31.7.47.
13 OTU Bicester/Finmere 1.44, Harwell, Middleton St George. To 54 OTU 1.5.47.
16 OTU Upper Heyford/Barford 31.12.44, Cottesmore. To 204 AFS, 3.48
51 OTU Cranfield 7.44 to 14.6.45
54 OTU Charter Hall 8.44, East Moor. To 13 OTU 1.5.47
60 OTU High Ercall 17.5.43. To 13 OTU 11.3.45
132 OTU East Fortune 15.5.44, Haverfordwest, East Fortune – 1947
Pathfinder Navigational Training unit, Upwood and Warboys, 6.43 to 1945
Mosquito Conversion Unit, Horsham, 30.8.42. Became 1655 Mosquito Training Unit, Marham, Finmere, Marham, Warboys, Became 16 OTU 31.12.44
1672 MCU Yellahanka 1.2.44, Kolar, Yellahanka. Disbanded 31.8.45
1692 Bomber Support Training Flight, Great Massingham 17.6.44 to 16.6.45. Code 4X.

### Other Units

1300 Met. Flt.; 1317 met. Flt.; 1401 Flt, 1942; 1409 Flt, 1.4.43 to 1946.

### Royal Navy Squadrons

728 Squadron, Hal Far, 1948 – 1950
762 Squadron, Ford, 2.46 – 11.49
771 Squadron, Gosport, 11.45, Lee-on-Solent 1950
790 Squadron, Dale, 10.45, Culdrose – 11.49
811 Squadron, Ford, 9.45, Brawdy – 7.47

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# APPENDIX 4

## SURVIVING MOSQUITOES*

| Mark | Identity | Country | Location | Subsequent identity, status |
|---|---|---|---|---|
| Prot. | W4050 | UK | London Colney, Herts | Ex E0234, public viewing since 1959 |
| NF.II | HJ711 | UK | York | Rebuild of HJ711, PF498, RS715 parts. |
| T.III | RR299 | UK | Chester | G-ASKH airworthy with B.Ae |
| T.III | TV959 | UK | London SE1 | Public viewing, IWM |
| T.III | TW117 | UK | London NW4 | Public viewing, RAF Museum |
| FB.VI | HR621 | Australia | Kogarah, NSW | Stored components |
| FB.VI | PZ474 | USA | Placentia, Calif. | Ex NZ2384, ZK-BCV, N9909F rebuild. |
| FB.VI | TA122 | UK | London Colney, Herts | Fuselage on public view. |
| FB.VI | TE758 | NZ | Christchurch | NZ2328 with parts of HR339/ NZ2382. |
| FB.VI | TE863 | NZ | Christchurch | NZ2325, stored with other parts. |
| FB.VI | TE910 | NZ | Nelson | NZ2336 stored. |
| PR.IX | LR480 | S. Africa | Jo'burg. | Public viewing |
| PR.XVI | NS631 | Australia | Mildura, Vic. | A.52-600 under restoration |
| B.20 | KB336 | Canada | Rockliffe, Ont. | Public viewing |
| FB.26 | KA114 | Canada | Richmond, B.C. | Stored |
| NF.30 | RK952 | Belgium | Brussels | MB.24 Public viewing |
| PR.34 | RG300 | USA | Texas | CAF, parts only, identity unconfirmed. |
| PR.35 | RS700 | Canada | Calgary, Alberta | CF-HMS – stored |
| B.35 | RS709 | UK | Blackbushe, Hants | G-ASKA, airworthy |
| B.35 | RS712 | UK | Strathallan | G-ASKB, airworthy |
| B.35 | TA634 | UK | London Colney, Herts | G-AWJV, public viewing since 1971. |
| B.35 | TA639 | UK | Gosford | Public viewing |
| B.35 | TA717 | Canada | Mission, BC | XB-TOX – bad condition, stored. |
| B.35 | TA719 | UK | Duxford | G-ASKC, stored |
| B.35 | TH988 | USA | Silver Hill | Stored for Nat. Aerospace Museum |
| B.35 | TJ118 | UK | St. Albans | Fuselage parts under restoration |
| B.35 | TJ138 | UK | Swinderby | Stored |
| B.35 | VP189 | Canada | Edmonton | CF-HMQ under restoration |
| B.35 | VP796 | Canada | Kapuskasing, Ont. | CF-HML under restoration |
| PR.41 | A52-210 | Australia | Sydney, NSW | VH-WAD under restoration |
| T.43 | A52-1053 | NZ | Ardmore, Auckland | NZ2305 under restoration |
| | | USA | Sun Valley, Calif. | Unidentified remains reported. |

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* List compiled by courtesy of Stuart Howe.

## Details of Surviving Mosquitoes

### AUSTRALIA

**Kogarah, NSW:** FB.VI HR621 built by Standard Motors in 1944. Left for Australia October 31, 1944, and arrived at Melbourne December 23. To 618 Squadron RAAF. Sold as scrap to farmer J. Cutmore, stored in open for 25 years; remains to G. H. Thomas for Camden Museum of Aviation.

**Mildura, Victoria:** PR.XVI NS631, built at Hatfield in late 1944 and shipped to Australia to become A52-600. To 87 Squadron as SU-A March 1, 1945, and flew 20 missions. Flew 321.50hr before retirement to Air and Ground Radio School at Ballarat, Victoria, on July 21, 1947. Disposed of in 1954 and stored in open for 12 years until acquired by Warbirds Aviation Museum for restoration.

**Sydney, NSW:** PR.41 A52-319, originally built at Banstown as FB.40 A52-210, but converted during production to PR.41 A52-319. Delivered to No 2 Aircraft Depot at Richmond on February 12, 1945, it was then ferried to 3 Aircraft Depot, where it was put into long-term storage. On March 20, 1953, the aircraft was purchased by Capt J. Woods and registered VH-WAD for the London to Christchurch Air Race. However, the aircraft was withdrawn owing to lack of finance and stored at Perth. It was apparently then bought by an American and dismantled, but did not leave Australia and deteriorated at Melbourne. In 1979 the aircraft was acquired by the Australian War Memorial Museum and is currently being restored for static display by Hawker de Havilland at Lidcombe.

### BELGIUM

**Brussels:** NF.30 RK952, built at Leavesden in early 1945 and delivered to 218 MU on May 25, moved to 10 MU on July 11. Sold to Belgium in October 1951, and delivered in 1953 as MB.24. It was issued to 10th Belgian Wing with the code ND-N until retirement at Beauvechain in October 1956. It was acquired to the Musée de L'Armée in March 1957.

### CANADA

**Calgary, Alberta:** B.35 RS700/CF-HMS, built by Airspeed in 1946 and delivered to 37 MU on November 25. Following moves to 9 MU and 19 MU it was converted at Leavesden to PR configuration and was delivered to 58 Squadron at Benson early in 1952. It was returned to 22 MU at Silloth on April 30, 1954, and was sold to Spartan Air Services in December. After overhaul by Derby Aviation at Burnaston it was ferried to Canada in late 1955. Following service on aerial survey it was retired and in 1972 acquired by the Centenial Planetarium for restoration, possibly to flying condition.

**Edmonton, Alberta:** B.35 VP189/CF-HMQ, built by Airspeed in 1947. After storage at 22 MU was overhauled by Derby Aviation for Spartan. During its survey career it operated in Kenya as VP-KOM, and in 1966 it was acquired by 418 (Reserve) Squadron RCAF for display at RCAF Nameo, painted as FB.VI VA114/TH-F. It was badly damaged when vandals broke its back, and has been in the care of Mr Bill Harvey, who is restoring it to static condition at Chipman.

**Kapuskasing, Ontario:** B.35 VR796/CF-HML, built by Airspeed in late 1947 and delivered to 22 MU, Silloth for storage on June 15, 1948. It was sold to Spartan on December 16, 1954, and after conversion by Derby Aviation left on its delivery flight on April 26, 1955. Following service on air survey work the aircraft was acquired by 647 Squadron, Canadian ATC, for restoration to flying condition.

**Mission, BC:** B.35 TA717/XB-TOX, built at Hatfield in 1945 and delivered to 44 MU Edzell on July 7. A move was made to Martin Hearn in February 1948 and then to 15 MU, Wroughton, on April 27. Bought by Cloux Clan Imports of the USA in May 1956, it was operated in Mexico as XB-TOX on air survey work. It ended up rotting near the airport at Mexico City, and was recently bought by Mike Meeker, who is restoring the aircraft, although it is unlikely to fly again.

**Richmond, BC:** FB.26 KA114 was built by D. H. Canada at Downsview and delivered on February 22, 1945, for service with 7 OTU at Digby, Nova Scotia. It was struck off charge on April 13, 1948, and later discovered on a farm in Alberta in very poor condition. It is now stored at the Canadian Museum of Flight and Transportation.

**Rockcliffe, Ontario:** B.XX KB336 built at Downsview for service in UK and transferred to the RCAF on June 1944, for use by 36 OTU. Retired to Service Repair Depot at Moncton on June 22, 1945, to become instructional airframe A535 on October 8, 1946. It went to Calgary on September 7, 1961, and was allocated to the National Aeronautical Collection on February 6, 1964, where it is now preserved in good condition.

## NEW ZEALAND

**Ardmore, Auckland:** T.43 NZ2305, built at Bankstown as FB.40 A52-19, was modified during production as T.43 A52-1053. It was accepted by the RAAF on August 6, 1946, and delivered to 3 Aircraft Depot at Archerfield, Queensland, where it was stored. It was sold to the RNZAF on December 18 as NZ2305 and operated by 75 Squadron from April 1, 1947 until 1952. It was bought by a Marton farmer, who donated it to the Museum of Transport and Technology. It is now being restored to static condition as, amongst other damage, the wings had been cut off.

**Christchurch:** FB.VI TE758/NZ2328 with many parts from FB.VI HR339/NZ2382, both built by Standard Motors at Coventry. TE758 was delivered to 19 MU St Athan on August 26, 1945, and moved to Pershore in February 1947 for delivery preparations. It left for New Zealand on March 6 and served with 75 Squadron as YC-C until retirement in 1956. HR339 had served with 487 and 16 Squadrons before leaving for New Zealand on October 16, 1947. Its condition is poor, and it is being restored by the Ferrymead Aviation Society at Harewood Airport.

**Christchurch:** FB.VI TE863, built by Standard Motors and delivered to 27 MU Shawbury on October 22, 1945. It flew with the Empire Central Flying School at Hullavington from March 17, 1947, but returned to Shawbury on May 9, before going to Pershore for delivery preparations. It left for New Zealand on July 22 to become NZ2355 and was stored until scrapped in the mid-1950s. It is being restored by Ted Packer using parts of RF597 and several other aircraft.

**Nelson:** FB.VI TE910/NZ2336, built by Standard Motors in October 1945 and delivered to 27 MU on November 19, where it was stored until bought by RNZAF. Moved to Pershore on December 12, 1946, for delivery preparation, departing on December 19. It did not arrive in Australia until April 3, 1947, and was issued to 75 Squadron on April 28 as YC-B. Retired in June 1955, it was acquired by John Smith, who keeps it in good condition, covered by a built-on corrugated iron and wood frame.

## SOUTH AFRICA

**Johannesburg:** PR.IX LR480, built at Hatfield and delivered to Benson on November 10, 1943. On June 8, 1944, it was issued to 60 Squadron SAAF at Foggia, Italy, flying unarmed high-level PR sorties over the Balkans and Austria. In December 1944 it was flown on a record-breaking attempt to Cape Town, but was damaged en route. Later repaired, the aircraft was donated to the South African National Museum of Military History at Saxonwold, where it is now displayed in the hangar roof.

## UNITED KINGDOM

**Auchterarder, Perthshire:** B.35 RS712, built by Airspeed and converted to TT.35 by Brooklands Aviation at Sywell between November 30, 1951, and May 1952. It was stored at 27 MU until issue to 1 CAACU at Hornchurch on December 31, 1953. Moved to the Armament Practice School at Schleswigland in March 1958. It was issued to 3 CAACU at Exeter in April 1958, and was transferred to Flying Training Command on June 30, 1961. Following retirement to 27 MU it was bought by Mirisch Films as G-ASKB on July 31, 1961, and used in the films *633 Squadron* and *Mosquito Squadron*. Following storage at Bovingdon and West Malling it was overhauled by Short Bros. and flown to Strathallan on November 8, 1975, where it is now preserved, but reported up for sale.

**Blackbushe, Hants:** B.35 RS709, built by Airspeed and delivered to 15 MU in early 1946. Converted to TT 35 by Brooklands Aviation from May 30, 1952, until October 2, for issue to 236 OCU on October 31. Stored at 27 MU September 23, 1954, until allocated to 3 CAACU on June 7, 1956, coded 47. Retired in May 1963 and sold to Mirisch on July 11 for filming. Acquired by Skyfame Museum to replace TA719, but later overhauled at Booker and sold to the Confederate Air Force, Texas, in December 1971 as N9797. Sold to Yesterday's Air Force, Chino and then bought by Doug Arnold, arriving at Blackbushe on November 28, 1979, after flying over Hatfield, a repeat of a flypast made on departure for America.

**Chester:** T.III RR299, built at Leavesden in March 1945 and delivered to 51 OCU at Cranfield on April 18, 1945. Its subsequent movements were as follows:- 27 MU, June 5, 1945; 1 Ferry Unit, Pershore, October 17, 1945; 109 MU, Fayid, December 5, 1945; 114 Squadron, Aden, December 27, 1945; Eastleigh MED/ME, February 27, 1947; 9 MU Cosford May 8, 1947; 204 AFS, Driffield, June 9, 1949; 22 MU Silloth August 16, 1950; Ferry Training unit, Benson September 2, 1954; 48 MU, Hawarden (Chester), December 20, 1954; 12 MU, Kirkbride, February 8, 1957; back to 48 MU, March 28, 1957; Home Command Examining Unit, White Waltham, May 6, 1957; Fighter Command Comm. Squadron, Bovingdon, February 11, 1959; 3/4 CAACU, April 14, 1959; retired to 27 MU, March 14, 1963, after flying 1,107hr 50min. Collected by Hawker Siddeley Aviation July 10, 1963, and flown to Chester; registered G.ASKH July 12. C of A granted June 23, 1965. Maintained in airworthy condition by British Aerospace.

**Cosford, Staffs:** B.35 TA639, built at Hatfield in early 1945 and delivered to 27 MU on April 16. Delivered to Brooklands Aviation in May 1952 for conversion to TT.35 and issued to the Aldergrove TT Flight. Returned to 27 MU in early 1954 for storage, until issued to 3 CAACU on September 30, 1959, numbered 50. In June 1963 the aircraft was delivered to the Central Flying School at Little Rissington, but was later given maintenance airframe number 7806M. It was moved to the RAF Museum's Henlow store on July 5, 1967, and later transferred to Cosford for static display.

**Duxford, Cambs:** B.35 TA719, built at Hatfield in early 1945 and stored at various MUs until delivered to Brooklands Aviation on August 15, 1953, for conversion to TT.35. Following a short period at 22 MU it was issued to 3 CAACU on June 30, 1954, numbered 56, being retired on March 31, 1963. Used in the filming of *633 Squadron*, it was then acquired by the Skyfame Museum on July 31, 1963, but seriously damaged in a deadstick landing at Staverton on July 27, 1964. The aircraft lay out on the airfield for some time, having been replaced by RS709, but with the departure of the latter TA719 was restored to static condition. It was moved to Duxford in 1978 following the closure of the Skyfame Museum.

**South Lambeth, London SE1:** T.III TV959, built at Leavesden in 1945 and delivered to 13 OTU on August 29, 1945. Its subsequent movements were as follows:- 266 Squadron, October 31, 1946; 54 OTU, April 24, 1947; 228 OCU, May 17, 1947; 22 MU, September 20, 1950; 204 AFS, July 15, 1951; 27 MU, February 6, 1952; Home Command Examining Unit, May 15, 1952; 49 MU, August 20, 1953; 27 MU, November 16, 1954; back to Home Command Examination Unit, December 16, 1955; 3 CAACU (CodeY), April 30, 1959; Struck off charge May 31, 1963, and allocated to the Imperial War Museum, where it is on public display with the starboard wing cut off outboard of the engine.

**Hendon, London NW4:** T.III TW117, built at Leavesden in early 1946 and delivered to 15 MU on May 30. Its subsequent movements were as follows:- 2 APS, Acklington, July 22, 1947; Linton-on-Ouse Stn. Flt., October 26, 1949, Coded MS-A; 204 AFS, July 31, 1951; 58 Squadron, Benson, February 28, 1953, coded OT; 48 MU, April 30, 1954; 5 MU, Kemble, September 30, 1956; 48 MU, November 30, 1956; 27 MU, July 31, 1958; 3 CAACU, March 31, 1960, coded Z. Retired to CFS May 31, 1963, where it was flown until structural problems with the glue joints forced its grounding. Stored at Henlow and moved to the RAF Museum at Hendon on its opening in 1972.

**London Colney, Hertfordshire:** Prototype W4050, built at Salisbury Hall in 1940 and first flown from Hatfield on November 25, 1940, in class B markings E0234. Renumbered W4050, the prototype was delivered to Boscombe Down on February 19, 1941, where on February 24 its fuselage fractured when the tail wheel caught in a rut. The damage was repaired, and trials recommenced on March 19. The initial tests were completed on May 23, when the aircraft returned to Hatfield for various aerodynamic developments, including the fitment of a mock-up turret. In October it was grounded for the installation of two-stage Merlin 61s, making its next flight on June 20, 1942, and later attaining 12,192m (40,000ft). Merlin 77s were then installed for flying to recommence on October 8. These engines allowed a top speed of 706km/hr (439mph) to be reached, the highest ever attained by a Mosquito in level flight. It was flown with Rolls-Royce on engine development from March 1 to June 10, 1943, following which it returned to Hatfield and had Merlin 21 series engines refitted. The following year the prototype was grounded for apprentice training, and appeared on static display at the SBAC shows at Radlett in 1946 and 1947, surrounded by a selection of loads. After storage in early 1959, going on display on May 15 as the first exhibit of what is now the Mosquito Aircraft Museum.

FB.VI TA122, built at Hatfield and delivered to 44 MU on March 10, 1945, for issue to 49 ARF ten days later. Its subsequent movements were as follows:- 605 Squadron, Coxyde, Belgium, April 3; moved to Volkel, Holland, April 25; 4 Squadron, September 13, to become part of 140 Wing at Gutersloh on April 25, 1946; 1 BR and SD Reserve Pool, November 25, 1948; reissued to 4 Squadron, January 13, 1949, at Wahn and later Celle in West Germany. Retired June 30, 1950, and reduced to spares, the fuselage being acquired by Delft University for training before storage at the RNAF base at Gilze Rijen. It was presented to the Mosquito Aircraft Museum in November 1975 and delivered on February 26, 1978. The fuselage has been restored, and a wing and many other parts have been located to complete the assembly of the aircraft.

B.35 TA634 was one of the last Hatfield-produced aircraft, built in 1945, and was stored at 22 MU before being converted to a TT.35. It was issued to 4 CAACU in November 1953, moving to 2nd TAF in March 1956. Its final service was with 3 CAACU at Exeter from September 1959 until retirement on November 6, 1963, when it was delivered to Liverpool Airport. It flew in the two films at Bovingdon, taking its flying time up to 732hr, 25min. Donated to the Mosquito Aircraft Museum in 1971, it was handed over by the Mayor of Liverpool on May 15, and is preserved in memory of Grp Capt Pickard and his Navigator, killed on the Amiens Prison raid.

B.35 TJ118, built at Hatfield in mid-1945 and delivered to 27 MU on September 7, where it remained until moving to Brooklands Aviation on April 3, 1952. The conversion to TT.35 was completed by August 28 for issue to 3 CAACU on September 30, until storage again at 27 MU on May 31, 1957; it was reissued to 3 CAACU on October 31, 1959, but it was written off in an accident, being struck off charge on September 18, 1961, for use as spares. The fuselage was acquired for filming studio scenes in 1963, when the nose was cut off and later dumped outside. It was rescued in 1973, the cockpit being restored by cadets of 220 Squadron ATC, St Albans, and the rear fuselage is stored in Oxford.

**Swinderby, Yorks:** B.35 TJ138, built at Hatfield in 1945, was delivered to 27 MU on August 28, 1945. Its subsequent movements were as follows:- Martlesham Heath, February 11, 1948; 27 MU, May 24; 98 Squadron, October 31, 1950; 38 MU, February 28, 1951, Brooklands Aviation, July 15, 1953, for conversion to TT.35; 5 CAACU, March 16, 1954; 27 MU, June 15, 1959; retired on July 5, becoming 7607 M at 71 MU, Bicester. Preserved at Colerne, Finningley and now Swinderby in 98 Squadron markings, coded VO.

**York:** NFII HJ711, built at Hatfield in May 1943 and issued to 169 Squadron (code VI) at Little Snoring, where it made the first kill for the squadron on January 30, 1944, by shooting down a Bf110 near Berlin. The aircraft is being restored single-handed by Tony Agar, who started with the nose of HJ711 and has added the wing from B.XVI PF498/6607M, used by the Civil Defence at Chorley, other wing parts from RN T.III VA 878 at St Davids, engines from NF.30 NT616 and the rear fuselage from B.35 RS715. The fuselage restoration is now practically complete, and will be followed by the wing.

## USA

**Placentia, Calif:** FB.VI PZ474, built at Hatfield in early 1945, was delivered to 19 MU at St Athan on April 19, and issued to 80 OTU on May 5 and 132 OTU East Fortune on June 13. On February 18, 1946, it was stored at 15 MU and sold to New Zealand on January 23, 1948, arriving on April 15. It became NZ2384, but saw little service and was purchased by Aircraft Supplies (NZ) Ltd for sale overseas as ZK-BCV. In February 1955 it was flown to the USA and became N9909F with the Insurance Finance Corp, who kept it at Whiteman Park airfield for many years. It was cancelled from the register in December 1970 and allowed to deteriorate, its fuselage being cut in two. It has been purchased by James Merizan, who is restoring it to static condition.

**Silver Hill, Maryland:** B.35 TH998 was built at Hatfield in 1945 and delivered to 27 MU on August 26. It remained in storage until May 14, 1952, when it was moved to Brooklands Aviation for TT.35 conversion. It was issued to 3 CAACU on September 30 until delivery to 60 MU on May 31, 1962. On August 31 it was declared surplus and donated to the National Air and Space Museum in Washington DC. It is currently stored pending the availability of display space.

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Compiled with the assistance of Stuart Howe.

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Amongst the many sources of information for this book, including individual accounts, the files at the Public Records Office and numerous other documentation were the following books:

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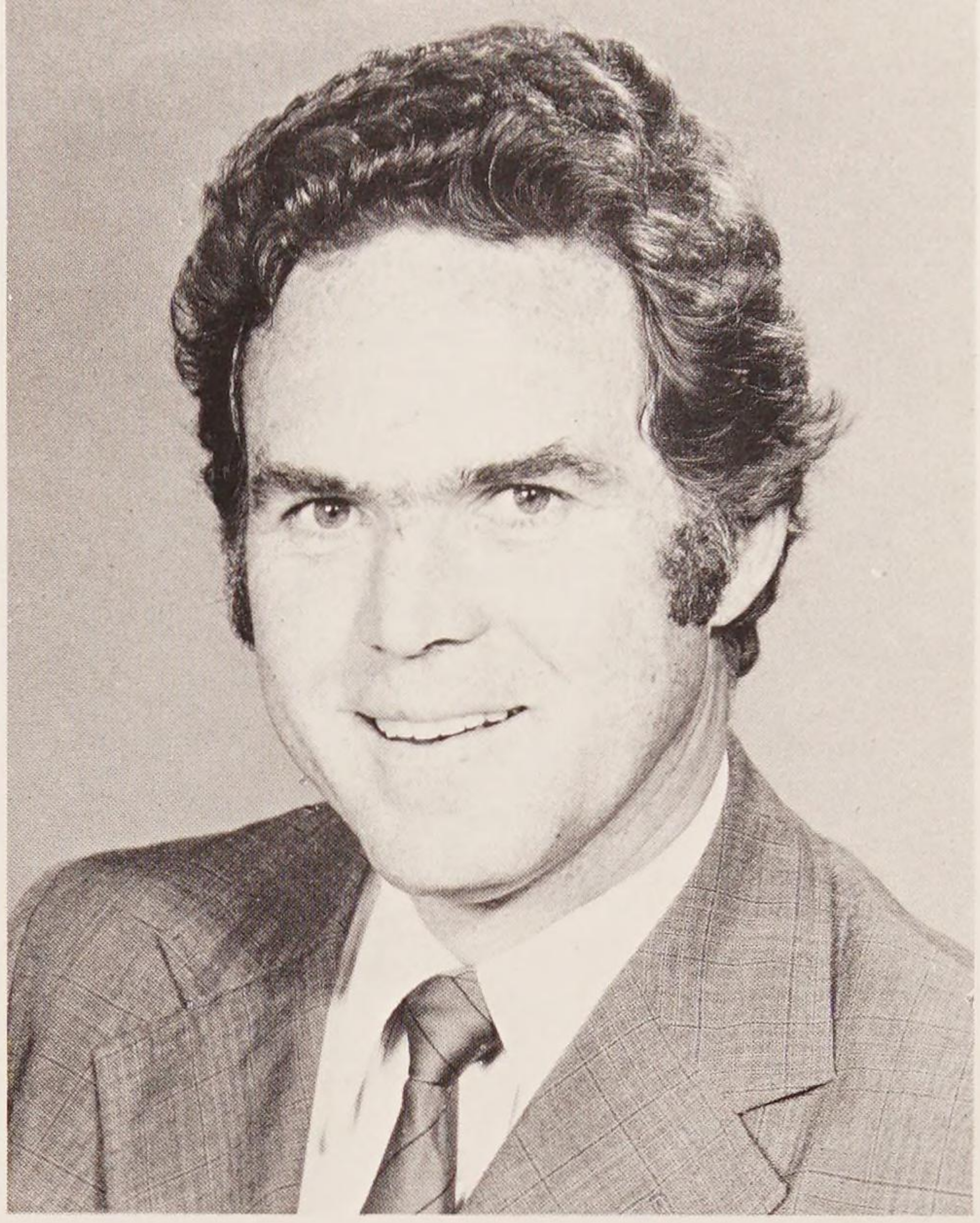

**Philip Birtles** was a student of the de Havilland Aeronautical Technical School and joined the de Havilland Aircraft Company at Hatfield in 1957. In 1962 he was appointed Personal Assistant to John Cunningham, Chief Test Pilot. He became, in 1969, Deputy Public Relations Manager, Hawker Siddeley Aviation at Hatfield. Since 1979 he has been Public Relations Manager, British Aerospace Dynamics Group, Stevenage Division.

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ISBN 0 531 03714 2

Printed in UK

YO-AEZ-468